SecureLinx™ Console Manager (SLC) User Guide

- SecureLinx SLC8
- SecureLinx SLC16
- SecureLinx SLC32
- SecureLinx SLC48

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Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his or her own expense, will be required to take whatever measures may be required to correct the interference.

Note: *This equipment has been tested and found to comply with the limits for Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this User Guide, may clause interference to radio communications. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his own expense.*

The user is cautioned that changes and modifications made to the equipment without approval of the manufacturer could void the user's authority to operate this equipment.

Changes or modifications to this device not explicitly approved by Lantronix will void the user's authority to operate this device.

The information in this guide may change without notice. The manufacturer assumes no responsibility for any errors that may appear in this guide.

Date	Rev.	Comments
6/06	A	Initial Release
8/06	B	Added event configuration, local/remote user authentication precedence, firmware update via HTTPS, complex passwords, and port permissions for remote users.
1/07	C	Added dial-in & dial-on-demand modem state, IP filters, active directory to LDAP section, and additional TACACS+ servers.
4/07	D	Added ability to import site-specific SSL certificates and SSH host keys, to display a list of web sessions, to set an IP filter timer, and to save system logs across reboots. Enabled dual boot-up.
8/07	E	Added gateway page, phone home; alarm delay; SSH v1 logins; trap community; configuration manage option; system logs beginning and end dates, device port logging to syslog.
4/08	F	New web page design with tabed menus. Added support for the following: Sensorsoft devices; SecureID over Radius; command and status of the SLP expansion chassis; escape and break sequences for remote users; password aging, iGoogle Gadget; SNMP v3 encryption; ability to copy boot bank; host lists for outgoing modem and direct connection at the CLI; new option for local users to display a custom menu at login.

Table of Contents

Figures

Tables

1: About This Guide

Purpose and Audience

This guide provides the information needed to install, configure, and use the products in the Lantronix SecureLinx™ Console Manager (SLC) family. It is for IT professionals who must remotely and securely configure and administer servers, routers, switches, telephone equipment, or other devices equipped with a serial port.

Chapter Summaries

The remaining chapters in this guide include:

Chapter	Summary
2: Overview	Describes the SLC models, their main features, and the protocols they support.
3: Installation	Provides technical specifications; describes connection formats and power supplies; provides instructions for installing the unit in a rack.
4: Quick Setup	Provides instructions for getting your unit up and running and for configuring required settings.
5: Web and Command Line Interfaces	Describes the web and command line interfaces available for configuring the unit. ***Note:*** *The configuration chapters (6-12) provide detailed instructions for using the web interface and include equivalent command line interface commands.*
6: Basic Parameters	Provides instructions for configuring network ports, firewall and routing settings, and date and time.
7: Services	Provides instructions for enabling and disabling system logging, SSH and Telnet logins, SNMP, SMTP, and the date and time.

Chapter	Summary
8: Devices	Provides instructions for configuring global device port settings, individual device port settings, and console port settings.
10: Connections	Provides instructions for configuring connections and viewing, updating, or disconnecting a connection.
11: User Authentication	Provides instructions for enabling or disabling methods that authenticate users who attempt to log in via SSH, Telnet, or the console port. Provides instructions for creating custom menus.
12: Maintenance	Provides instructions for upgrading firmware, viewing system logs and diagnostics, generating reports, and defining events. Includes information about web pages and commands used to shut down and reboot the SLC.
13: Application Examples	Shows how to set up and use the SLC in three different configurations.
14: Command Reference	Lists and describes all of the commands available on the SLC command line interface
A: Bootloader	Lists and describes the commands available for the bootloader command line interface.
B: Security Considerations	Provides tips for enhancing SLC security.
C: Safety Precautions	Lists safety precautions for using the SLC.
D: Adapters and Pinouts	Includes adapter pinout diagrams.
E: Protocol Glossary	Lists the protocols supported by the SLC with brief descriptions.
F: Compliance Information	Provides information about the SLC's compliance with industry standards.
G: Warranty	

Additional Documentation

The following information is available on the product CD, the Lantronix web site (www.lantronix.com), or the product itself:

SLC Quick Start	Describes the steps for getting the SLC up and running; provided on the CD and in printed form.
SLC Online Help for the Command Line Interface	Provides online help for configuring the SLC using commands.
SLC Online Help for the Web Interface	Provides online help for configuring the SLC using the web page.
Detector™ Online Help	Provides online help for assigning a static IP address to the SLC using the Detector™ tool on the product CD.

2: Overview

SecureLinx SLC Console Managers are members of the Lantronix SecureLinx IT Management family of products. These products offer systems administrators and other IT professionals a variety of tools to securely access and manage their resources. Lantronix has been an innovator in this market with terminal servers and secure console servers, as well as other remote access devices. The SLC Console Managers build on that foundation and offer new features and capabilities.

IT equipment can be configured, administered, and managed in a variety of ways, but most devices have one method in common: an RS-232 serial port, sometimes called a console, auxiliary, or management port. These ports are often accessed directly by connecting a terminal or laptop to them, meaning that the administrator must be in the same physical location as the equipment. SLC Console Managers give the administrator a way to access them remotely from anywhere there is a network or modem connection.

Many types of equipment can be accessed and administered using Console Managers, including:

- **Servers:** Unix, Linux, Windows 2003, and others.
- **Networking equipment:** routers, switches, storage networking.
- **Telecom:** PBX, voice switches.
- **Other systems with serial interfaces:** heating/cooling systems, security/building access systems, UPS, medial devices.

The key benefits of using Console Managers:

- **Saves money:** Enables remote management and troubleshooting without sending a technician onsite. Reduces travel costs and downtime costs.
- **Saves time:** Provides instant access and reduces response time, improving efficiency.
- **Simplifies access:** Enables you to access equipment securely and remotely after hours and on weekends and holidays—without having to schedule visits or arrange for off-hour access.
- **Protects assets:** Security features provide encryption, authentication, authorization, and firewall features to protect your IT infrastructure while providing flexible remote access.

SLC console servers provide features such as convenient text menu systems, break-safe operation, port buffering (logging), remote authentication, and Secure Shell (SSH) access. Dial-up modem support ensures access when the network is not available.

SLC Models

These SLC models offer a compact solution for remote and local management of up to 48 devices (e.g., servers, routers, and switches) with RS-232C (now EIA-232) compatible serial consoles in a 1U-tall rack space.

All models have two Ethernet ports, referred to in this User Guide as Eth1 and Eth2.

Note: *One possible use for the two Ethernet ports is to have one port on a private, secure network and the other on a public, unsecured network.*

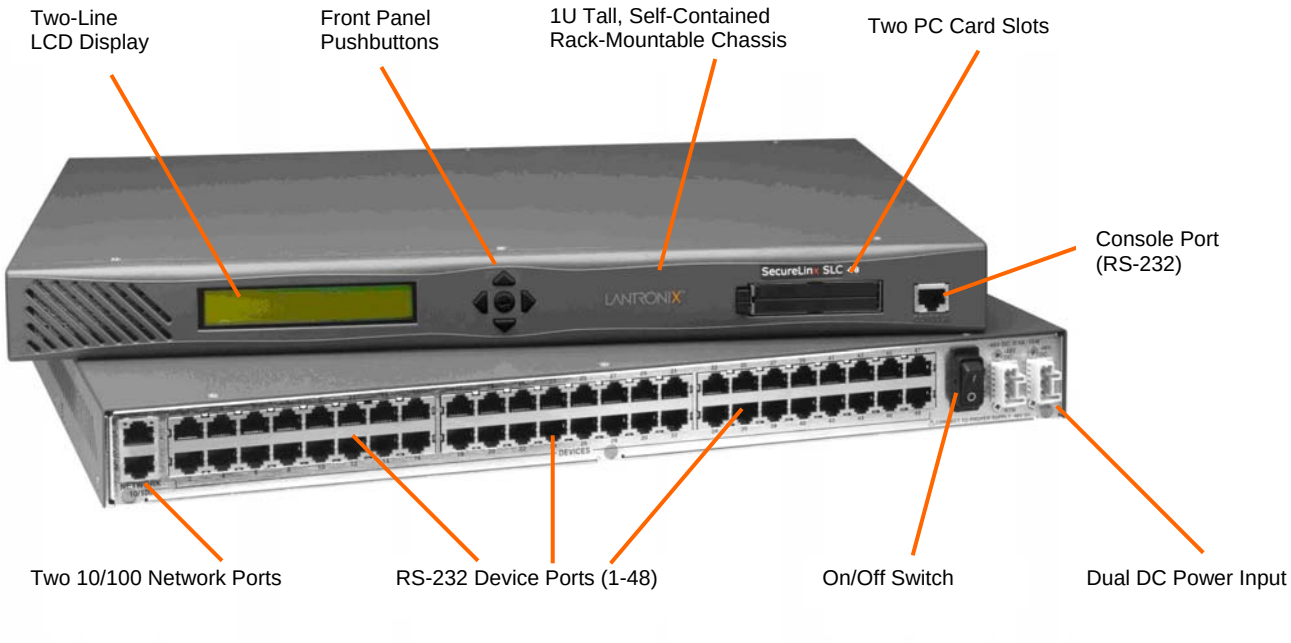
This User Guide covers the following products:

Table 2-1. SLC Models

Part Number	Model and Description
SLC00812N-02	**SLC8:** 8 port, Single AC Supply Secure Console Manager
SLC01612N-02	**SLC16:** 16 Port, Single AC Supply Secure Console Manager
SLC03212N-02	**SLC32:** 32 Port, Single AC Supply Secure Console Manager
SLC04812N-02	**SLC48:** 48 Port, Single AC Supply Secure Console Manager
SLC00822N-02	**SLC8**: 8 Port, Dual AC Supply Secure Console Manager
SLC01622N-02	**SLC16:** 16 Port, Dual AC Supply Secure Console Manager
SLC03222N-02	**SLC32:** 32 Port, Dual AC Supply Secure Console Manager
SLC04822N-02	**SLC48:** 48 Port, Dual AC Supply Secure Console Manager
SLC00824T-02	**SLC8:** 8 Port, Dual DC Supply Secure Console Manager
SLC01624T-02	**SLC16:** 16 Port, Dual DC Supply Secure Console Manager
SLC03224T-02	**SLC32:** 32 Port, Dual DC Supply Secure Console Manager
SLC04824T-02	**SLC48:** 48 Port, Dual DC Supply Secure Console Manager

The products differ only in the number of device ports provided and in AC or DC power availability. Some models have dual entry redundant power supplies for mission critical applications. They are available in AC or DC powered versions. The following figure depicts the SLC48; the other models are similar.

Figure 2-1. SLC - 48 Device Ports, 2 Network Ports, 1 Console Port, Dual DC Powered



System Features

The SLC has the following capabilities:

- Connects up to 48 RS-232 serial consoles
- 10Base-T/100Base-TX Ethernet network compatibility
- Buffer logging to file
- Email and SNMP notification
- ID/Password security, configurable access rights
- Secure shell (SSH) security; supports numerous other security protocols
- Network File System (NFS) and Common Internet File System (CIFS) support
- Telnet or SSH to a serial port by IP address per port or by IP address and TCP port number
- Configurable user rights for local and remotely authenticated users
- Supports an internal PC Card modem or an external modem
- No unintentional break ever sent to attached servers (Solaris Ready)
- Simultaneous access on the same port - "listen" and "direct" connect mode
- Local access through a console port
- Web administration (using most browsers)

Protocols Supported

The SLC supports the TCP/IP network protocol as well as:

- SSH, Telnet, PPP, NFS, and CIFS for connections in and out of the SLC
- SMTP for mail transfer.
- DNS for text-to-IP address name resolution
- SNMP for remote monitoring and management
- FTP and SFTP for file transfers and firmware upgrades
- TFTP for firmware upgrades
- DHCP and BOOTP for IP address assignment
- HTTPS (SSL) for secure browser-based configuration
- NTP for time synchronization
- LDAP, NIS, RADIUS, CHAP, PAP, Kerberos, TACACS+, and SecurID (via RADIUS) for user authentication

For brief descriptions of these protocols, see *E: Protocol Glossary*.

Access Control

The system administrator controls access to attached servers or devices by assigning access rights to up to 128 user profiles. Each user has an assigned ID, password, and access rights. Other user profile access options may include externally configured authentication methods such as NIS and LDAP.

Device Port Buffer

The SLC supports real-time data logging for each device port. The port can save the data log to a file, send an email notification of an issue, or take no action.

You can define the path for logged data on a port-by-port basis, configure file size and number of files per port for each logging event, and configure the device log to send an email alert message automatically to the appropriate parties indicating a particular error.

Configuration Options

You may use the backlit front-panel LCD display for initial setup and later to view and configure current network, console, and date/time settings.

Both a web interface viewed through a standard browser and a command line interface (CLI) are available for configuring the SLC settings and monitoring performance.

Hardware Features

The SLC hardware includes the following:

- 1U-tall (1.75 inches) rack-mountable secure console server
- Two 10Base-T/100Base-TX network ports
- Up to 48 RS-232 serial device ports connected via Category 5 (RJ45) wiring
- One serial console port for VT100 terminal or PC with emulation
- Two PC Card slots
- 256 Kbytes-per-port buffer memory for device ports
- LCD display and keypad on the front
- Universal AC power input (100-240V, 50/60 Hz); options include single input, single supply or dual input, redundant supplies
- -48 VDC power input, dual input, redundant power supplies
- Convection cooled, silent operation, low power consumption

Note: *For more detailed information, see Technical Specifications on page 20.*

All physical connections use industry-standard cabling and connectors. The network and serial ports are on the rear panel of the SLC, and the console port is on the front. Required cables and adapters for certain servers, switches, and other products are available from Lantronix (see www.lantronix.com).

Serial Connections

All devices attached to the device ports and the console port must support the RS-232C (EIA-232) standard. Category 5 cabling with RJ45 connections is used for the device port connections and for the console port. (For pinout information, see *D: Adapters and Pinouts*.)

Note: *RJ45 to DB9/DB25 adapters are available from Lantronix.*

Device ports and the console port support eight baud-rate options: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, and 115200 baud.

Figure 2-2. Device Port Connections

Figure 2-3. Console Port Connection

Network Connections

The SLC network interfaces are 10Base-T/100Base-TX connectors for use with a conventional Ethernet network. Use standard RJ45-terminated Category 5 cables. Network parameters must be configured before the SLC can be accessed over the network.

Figure 2-4. Network Connection

PC Card Interface

The SLC has two PC Card slots. Lantronix qualifies cards continuously and publishes a list of qualified cards on the Lantronix web site.

Figure 2-5. PC Card Interface

3: Installation

This chapter provides a high-level procedure for installing the SLC followed by more detailed information about the SLC connections and power supplies.

Caution: ***To avoid physical and electrical hazards, please be sure to read B: Safety Information before installing the SLC.***

What's in the Box

In addition to the SLC, the box contains the following items:

Part #	Component Description
Adapters:	
200.2066A	Adapter: DB25M (DCE), Sun w/DB25 female
200.2067A	Adapter: DB25F (DCE) to RJ45, Sun w/DB25 male and some HP9000's
200.2069A	Adapter: DB9M (DCE) to RJ45, SGI Onyx
200.2070A	Adapter: DB9F (DCE) to RJ45, HP9000, SGI Origin, IBM RS6000, and PC-based Linux servers
ADP010104-01	Adapter: RJ45 rolled serial, Cisco, and Sun Netra
Note: *An optional adapter for external modems is also available from Lantronix: 200.2073 Adapter: DB25M (DCE) to RJ45, external modems.*	
Cables:	
200.0063	Cable: RJ45 to RJ45, 6.6 ft (2 m)
500-153	Cable: Loopback
Power Cords:	
500-041	For single AC models: one AC power cord For dual AC models: two AC power cords
083-011	For dual DC models: one accessory kit, containing DC plug connectors and instructions
Documentation:	
CD Case	Quick Start Guide and CD_ROM containing the SecureLinx Console Manager User Guide

Verify and inspect the contents of the SLC package using the enclosed packing slip or the table above. If any item is missing or damaged, contact your place of purchase immediately.

Product Information Label

The product information label on the underside of the unit contains the following information about each specific unit:

- Part Number
- Serial Number Bar Code
- Serial Number and Date Code
- Regulatory Certifications and Statements

Technical Specifications

Table 3-1. SLC Technical Specifications

Serial Interface (Device)	RJ45-type 8-conductor connector (DTE) Speed software selectable (300 to 115,200 baud)
Serial Interface (Console)	RJ45-type 8-pin connector (DTE) Speed software selectable (300 to 115,200 baud)
Network Interface	10Base-T/100Base-TX RJ45 Ethernet
Power Supply	Universal AC power input: 100-240 VAC, 50 or 60 Hz IEC-type regional cord set included DC power input : -24 to -60 VDC
Power Consumption	Less than 20 watts
Dimensions	1U, 1.75 in x 17.25 in x 12 in
Weight	10 lbs or less, depending on the options
Temperature	Operating: 0 to 50 °C (32 to 122 °F), 30 to 90 %RH, non-condensing Storage: -20 to 70 °C (-4 to 158 °F), 10 to 90 %RH, non-condensing
Relative Humidity	Operating: 10% to 90% non-condensing; 40% to 60% recommended Storage: 10% to 90% non-condensing
Heat Flow Rate	68 BTU per hour

You can install the SLC either in an EIA-standard 19-inch rack (1U tall) or as desktop unit. The SLC uses convection cooling to dissipate excess heat.

Physical Installation

To install the unit in a rack:

1. Place the unit in a 19-inch rack.

   ***Warning:* Be careful not to block the air vents on the sides of the unit. If you mount the SLC in an enclosed rack, we recommended that the rack have a ventilation fan to provide adequate airflow through the unit.**

2. Connect the serial device(s) to the SLC device ports. See *Connecting to a Device Port* on page 21.
3. Install any PC Cards you intend to use. If you install a modem card, connect to the phone line. See *9: PC Cards*. You have the following options:

   a) To configure the SLC using the network, or to monitor serial devices on the network, connect at least one SLC network port to a network. See *Connecting to a Network Port* on page 22.

   b) To configure the SLC using a dumb terminal or a computer with terminal emulation, connect the terminal or PC to the SLC console port. See *Connecting a Terminal* on page 22.

4. Connect the power cord, and apply power. See *Power* on page 23.
5. Wait approximately a minute and a half for the boot process to complete.

   When the boot process ends, the SLC host name and the clock appear on the LCD display.

Now you are ready to configure the network settings as described in *4: Quick Setup*.

Connecting to a Device Port

You can connect any device that has a serial console port to a device port on the SLC for remote administration. The console port must support the RS-232C interface.

Note: *Many servers must either have the serial port enabled as a console or the keyboard and mouse detached. Consult the server hardware and/or software documentation for more information.*

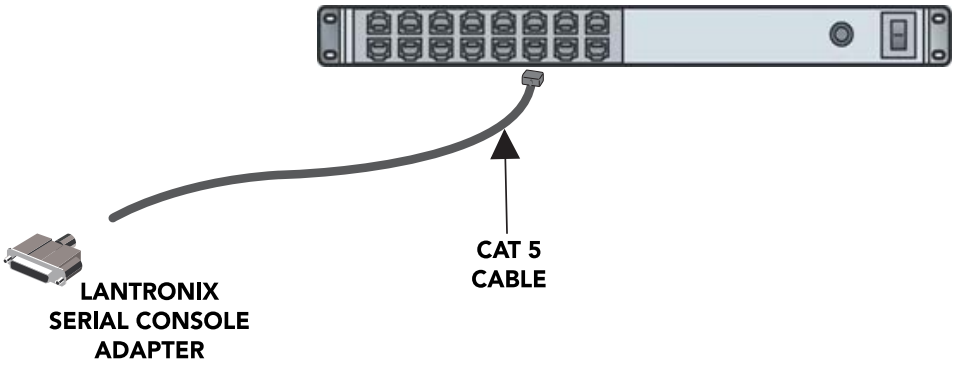
To connect to a device port:

1. Connect one end of the Cat 5 cable to the device port.
2. Connect the other end of the Cat 5 cable to a Lantronix serial console adapter.

Note: *To connect a device port to a Lantronix SLP, use the rolled serial cable provided with the unit, a 200.2225 adapter and Cat 5 cabling, or the ADP010104 adapter that eliminates the need for an additional Cat5 patch cable between the adapter and the connected equipment. See* D: Adapters and Pinouts *for more information about Lantronix adapters.*

3. Connect the adapter to the serial console of the serial device.

Figure 3-1. CAT 5 Cable Connection



Connecting to a Network Port

The SLC's network ports (10Base-T/100Base-TX) allow remote access to the attached devices and the system administrative functions. Use a standard RJ45-terminated Category 5 cable to connect to the network port.

Note: *One possible use for the two Ethernet ports is to have one port on a private, secure network, and the other on an unsecured network.*

Connecting a Terminal

The console port is for local access to the SLC and the attached devices. You may attach a dumb terminal or a computer with terminal emulation to the console port. The SLC console port uses RS-232C protocol and supports VT100 emulation. The default baud rate is 9600.

To connect the console port to a terminal or computer with terminal emulation, Lantronix offers optional adapters that provide a connection between an RJ45 jack and a DB9 or DB25 connector. The console port is configured as DTE. For more information, see *D: Adapters and Pinouts* and our web site at www.lantronix.com/support. and click Cable/Adapter Lookup on the **Support** menu.

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To connect a terminal:

1. Attach the Lantronix adapter to your terminal (use **PN 200.2066A** adapter) or your PC's serial port (use **PN 200.2070A** adapter).
2. Connect the Cat 5 cable to the adapter, and connect the other end to the SLC console port.
3. Turn on the terminal or start your computer's communication program (e.g., HyperTerminal for Windows).
4. Once the SLC is running, press **Enter** to establish connection. You should see the model name and a **login** prompt on your terminal. You are connected.

Power

The SLC consumes less than 20W of electrical power.

AC Input

The SLC has a universal auto-switching AC power supply. The power supply accepts AC input voltage between 100 and 240 VAC with a frequency of 50 or 60 Hz. Rear-mounted IEC-type AC power connector(s) are provided for universal AC power input (North American cord provided).

The SLC0xx12N models have a single supply/input, while the SLC0xx22N models have dual inputs and dual supplies. The power connector also houses a replaceable protective fuse (fast-blow 4.0A, maximum 250V AC) and the on/off switch. In addition, we provide the SLC0xx22N with a "Y" cord. (See *SLC Models* on page 14.)

Figure 3-2. AC Power Input and Power Switch (SLCxxxx2N)

Note: *The SLC48 with dual AC does not have an on/off switch.*

DC Input

The DC version of the SLC accepts standard –48 VDC power. The SLC0xx24T models accept two DC power inputs for supply redundancy. Lantronix provides the DC power connections using industry standard Wago connectors. One set of connectors is included with the SLC. You can order additional connectors (part number 721-103/031-000) from the Wago catalog:
http://www.wagocatalog.com/okv3/index.asp?lid=1&cid=1&str_from_home=first

Figure 3-3. DC Power Inputs and Power Switch (SLCxxx24T)

4: Quick Setup

This chapter helps get the IP network port up and running quickly, so you can administer the SLC using your network. To set up the network connections quickly, we suggest you do one of the following:

- Use the front panel LCD display and pushbuttons.
- Complete the Quick Setup web page on the web interface.
- SSH to the command line interface and follow the Quick Setup script on the command line interface.
- Connect to the console port and follow the Quick Setup script on the command line interface.

Note: *The first time you power up the SLC, Eth1 tries to obtain its IP address via DHCP. If you have connected Eth1 to the network, and Eth1 is able to acquire an IP address, you can view this IP address on the LCD or by running the Detector tool on the product CD. If Eth1 cannot acquire an IP address, you cannot use Telnet, SSH, or the web interface to run Quick Setup.*

IP Address

Your SLC must have a unique IP address on your network. The system administrator generally provides the IP address and corresponding subnet mask and gateway. The IP address must be within a valid range, unique to your network, and in the same subnet as your PC.

You have the following options for assigning an IP address to your unit.

Table 4-1. Methods of Assigning an IP Address

Method	Description
DHCP	A DHCP server automatically assigns the IP address and network settings. The SLC is DHCP-enabled by default. With the Eth1 network port connected to the network, and the SLC powered up, Eth1 acquires an IP address, viewable on the LCD. At this point, you can Telnet into the SLC, or use the web interface.
BOOTP	Similar to DHCP but for smaller networks.
Detector™	A Windows-based application on the product CD for viewing a DHCP-provided IP address or for assigning a static IP address to the SLC. You can use Detector only if you have not already assigned a static IP address by another method. For more information, see Detector's online help.

Method	Description
Front panel LCD display and pushbuttons	You manually assign the IP address and other basic network, console, and date/time settings. If desired, you can restore the factory defaults.
Serial port login to command line interface	You assign an IP address and configure the SLC using a terminal or a PC running a terminal emulation program to the unit's serial console port connection.

Method #1 Using the Front Panel Display

Before You Begin

Make sure you know:

- An IP address that will be unique and valid on your network (unless automatically assigned)
- Subnet mask (unless automatically assigned)
- Gateway
- DNS settings
- Date, time, and time zone
- Console port settings: baud rate, data bits, stop bits, parity, and flow control

Make sure the SLC is plugged in to power and turned on.

Front Panel LCD Display and Pushbuttons

With the SLC powered up, you can use the front panel display and pushbuttons to set up the basic parameters.

Figure 4-1. Front Panel LCD Display and Five Pushbuttons (Enter, Up, Down, Left, Right)

The front panel display initially shows the host name and the date and time. Using the five pushbuttons, you can change the network, console port, and date/time settings and view the firmware release version. If desired, you can restore the factory defaults.

Note: *Have your information handy as the display times out without accepting any unsaved changes if you take more than 30 seconds between entries.*

Any changes made to the network, console port, and date/time settings take effect immediately.

Navigating

The front panel has one **Enter** button (in the center) and four arrow buttons (**up, left, right,** and **down**). Press the arrow buttons to navigate from one option to another, or to increment or decrement a numerical entry of the selected option. Use the **Enter** button to select an option to change or to save your settings.

Action	Button
To move to the next option (e.g., from Network Settings to Console Settings)	**right arrow**
To return to the previous option	**left arrow**
To enter edit mode	**Enter** (center button)
Within edit mode, to increase or decrease a numerical entry	**up** and **down arrows**
Within edit mode, to move the cursor right or left	**right** or **left arrows**
To exit edit mode	**Enter**
To scroll up or down the list of parameters within an option (e.g., from IP Address to Mask)	**up** and **down arrows**

Table 4-2. Front Panel Setup Options with Associated Parameters

right/left arrow

up/down arrow

Normal	Network Settings	Console Settings	Date / Time Settings	Release
	Eth1 IP Address	Baud Rate Data Bits Stop Bits Parity Flow Control	Time Zone	Firmware version and date code (view only)
	Eth1 Subnet Mask		Date/Time	
	Gateway			Restore Factory Defaults
	DNS1			
	DNS2			
	DNS3			

Entering the Settings

To enter setup information:

1. From the normal display (host name, date and time), press the **right arrow** button to display **Network Settings**. The IP address for Eth1 displays.

Note: *If you have connected Eth1 to the network, and Eth1 is able to acquire an IP address through DHCP, this IP address displays, followed by the letter* ***[D]****. Otherwise, the IP address displays as all zeros (000.000.000.000).*

2. Press the **Enter** button on the keypad to enter edit mode. A cursor displays below one character of the existing IP address setting.
3. To enter values:
   - Use the **left** or **right arrow** to move the cursor to the left or to the right position.
   - Use the **up** or **down arrow** to increment or decrement the numerical value.
4. When you have the IP address as you want it, press **Enter** to exit edit mode, and then press the **down arrow** button. The Subnet Mask parameter displays.

Note: *You must edit the IP address and the Subnet Mask together for a valid IP address combination.*

5. To save your entries for one or more parameters in the group, press the **right arrow** button. The **Save Settings? Yes/No** prompt displays.

Note: *If the prompt does not display, make sure you are no longer in edit mode.*

6. Use the **left/right arrow** buttons to select **Yes**, and press the **Enter** button.
7. Press the **right arrow** button to move to the next option, **Console Settings**.
8. Repeat steps 2-7 for each setting.
9. Press the **right arrow** button to move to the next option, **Date/Time Settings**, and click **Enter** to edit the time zone.
   a) To enter a US time zone, use the **up/down arrow** buttons to scroll through the US time zones, and then press **Enter** to select the correct one.
   b) To enter a time zone outside the US, press the **left arrow** button to move up to the top level of time zones. Press the **up / down arrow** button to scroll through the top level.

      A time zone with a trailing slash (such as Africa/) has sub-time zones. Use the **right arrow** button to select the Africa time zones, and then the **up/down arrows** to scroll through them.

      Press **Enter** to select the correct time zone. To move back to the top-level time zone at any time, press the **left arrow**.
10. To save your entries, press the **right arrow** button. The **Save Settings? Yes/No** prompt displays.

Note: *If the prompt does not display, make sure you are no longer in edit mode.*

11. Use the **left/right arrow** buttons to select **Yes**, and press the **Enter** button.
12. To review the saved settings, press the **up** or **down arrows** to step through the current settings.

When you are done, the front panel returns to the clock display. The network port resets to the new settings, and you can connect to your IP network for further administration. You should be able to Telnet or SSH to the SLC through your network connection, or access the web interface through a web browser.

Restoring Factory Defaults

To use the LCD display to restore factory default settings:

1. Press the **right arrow** button to move to the last option, **Release**.
2. Use the **down arrow** to move to the **Restore Factory Defaults** option. A prompt for the 6-digit **Restore Factory Defaults** password displays.
3. Press **Enter** to enter edit mode.
4. Using the **left** and **right arrows** to move between digits and the **up** and **down** arrows to change digits, enter the password (the default password is 999999).

   Note: *The **Restore Factory Defaults** password is only for the LCD. You can change it at the command line interface using the* `admin keypad password` *command.*
5. Press **Enter** to exit edit mode. If the password is valid, a **Save Settings? Yes/No** prompt displays.
6. To initiate the process for restoring factory defaults, select **Yes**. When the process is complete, the SLC reboots.

Method #2 Quick Setup on the Web Page

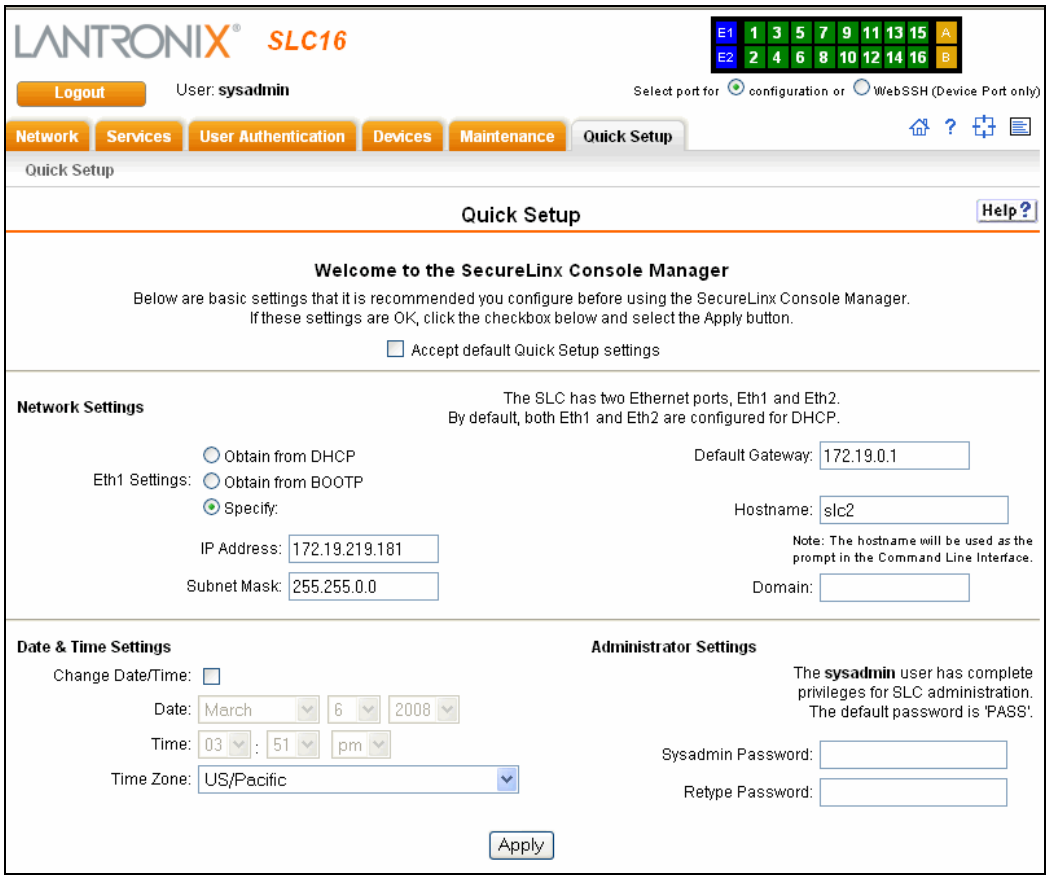
After the unit has an IP address, you can use the Quick Setup web page to configure the remaining network settings. This page displays the first time you log into the SLC only. Otherwise, the SLC Home Page displays. (For information about the web interface, see *Web Interface* on page 34.)

To complete the Quick Setup page:

1. Open a web browser (Netscape Navigator 6.x and above or Internet Explorer 5.5. and above, with JavaScript enabled).
2. In the URL field, type **https://** followed by the IP address of your SLC.

   Note: *The web server listens for requests on the unencrypted (HTTP) port (port 80) and redirects all requests to the encrypted (HTTPS) port (port 443).*
3. Log in using **sysadmin** as the user name and **PASS** as the password. The first time you log in to the SLC, the Quick Setup page automatically displays. Otherwise, the Home page displays.

Note: To open the Quick Setup page at another time, click the **Quick Setup** tab.



4. To accept the defaults, select the **Accept default Quick Setup settings** checkbox in the top portion of the page and click the **Apply** button at the bottom of the page. Otherwise, continue with step 5.

   Note: *Once you click the **Apply** button on the Quick Setup page, you can continue using the web interface to configure the SLC further.*

5. Enter the following:

Network Settings

Note: *Configurations with the same IP subnet on multiple interfaces (Ethernet or PPP) are not currently supported.*

Eth 1 Settings	**Disabled:** If selected, disables the network port. Default is Eth1 enabled. **Obtain from DHCP:** Acquires IP address, subnet mask, hostname and gateway from the DHCP server. (The DHCP server may not provide the hostname gateway, depending on its setup.) This is the default setting. If you select this option, skip to **Gateway**. **Obtain from BOOTP:** Lets a network node request configuration information from a BOOTP "server" node. If you select this option, skip to **Gateway**. **Specify:** Lets you manually assign a static IP address, generally provided by the system administrator.

IP Address (if specifying)	Enter an IP address that will be unique and valid on your network. There is no default. Enter all IP addresses in dot-quad notation. Do not use leading zeros in the fields for dot-quad numbers less than 100. For example, if your IP address is 172.19.201.28, do not enter 028 for the last segment. ***Note:*** *Currently, the SLC does not support configurations with the same IP subnet on multiple interfaces (Ethernet or PPP).*
Subnet Mask	If specifying an IP address, enter the network segment on which the SLC resides. There is no default.
Default Gateway	The IP address of the router for this network. There is no default.
Hostname	The default host name is slcXXXX, where XXXX is the last 4 characters of the hardware address of Ethernet Port 1. There is a 64-character limit (contiguous characters, no spaces). The host name becomes the prompt in the command line interface.
Domain	If desired, specify a domain name (for example, support.lantronix.com). The domain name is used for host name resolution within the SLC. For example, if **abcd** is specified for the SMTP server, and **mydomain.com** is specified for the domain, if **abcd** cannot be resolved, the SLC attempts to resolve **abcd.mydomain.com** for the SMTP server.

Date & Time Settings

Change Date/Time	Select the checkbox to manually enter the date and time at the SLC's location.
Date	From the drop-down lists, select the current month, day, and year.
Time	From the drop-down lists, select the current hour and minute.
Time Zone	From the drop-down list, select the appropriate time zone.

Administrator Settings

Sysadmin Password/ Retype Password	To change the password (e.g., from the default) enter a password of up to 64 characters.

6. To save your entries, click the **Apply** button.

Method #3 Quick Setup on the Command Line Interface

If the SLC does not have an IP address, you can connect a dumb terminal or a PC running a terminal emulation program (VT100) to access the command line interface. (See *Connecting a Terminal* on page 22.) If the unit has an IP address, you can use SSH or Telnet to connect to the SLC.

Note: *By default, Telnet is disabled and SSH is enabled. To enable Telnet, use the Services web page (see 7: Services), a serial terminal connection, or an SSH connection.*

To complete the command line interface Quick Setup script:

1. Do one of the following:
   - With a serial terminal connection, power up, and when the command line displays, press **Enter**.
   - With a network connection, use an SSH program or Telnet program (if Telnet has been enabled) to connect to **xx.xx.xx.xx** (the IP address in dot quad notation), and press **Enter**. You should be at the **login** prompt.
2. Enter **sysadmin** as the user name and press **Enter**.
3. Enter **PASS** as the password and press **Enter**. The first time you log in, the Quick Setup script runs automatically. Normally, the command prompt displays.

Figure 4-2. Beginning of Quick Setup Script

```
Welcome to the SecureLinx Console Manager
    Model Number: SLC48


    Quick Setup will now step you through configuring a few basic settings.


    The current settings are shown in brackets ('[]').
    You can accept the current setting for each question by pressing <return>.
```

4. Enter the following information at the prompts:

   Note: *To accept a default or to skip an entry that is not required, press* ***Enter****.*

Configure Eth1	Select one of the following: **<1> obtain IP Address from DHCP:** The unit will acquire the IP address, subnet mask, hostname and gateway from the DHCP server. (The DHCP server may or may not provide the hostname and gateway, depending on its setup.) This is the default setting. **<2> obtain IP Address from BOOTP:** Permits a network node to request configuration information from a BOOTP "server" node. **<3> static IP Address:** Allows you to assign a static IP address manually. The IP address is generally provided by the system administrator.

IP Address (if specifying)	An IP address that will be unique and valid on your network and in the same subnet as your PC. There is no default. If you selected **DHCP** or **BOOTP**, this prompt does not display. Enter all IP addresses in dot-quad notation. Do not use leading zeros in the fields for dot-quad numbers less than 100. For example, if your IP address is 172.19.201.28, do not enter 028 for the last segment. ***Note:*** *Configurations with the same IP subnet on multiple interfaces (Ethernet or PPP) are not currently supported.*
Subnet Mask	The subnet mask specifies the network segment on which the SLC resides. There is no default. If you selected **DHCP** or **BOOTP**, this prompt does not display.
Default Gateway	IP address of the router for this network. There is no default.
Hostname	The default host name is slcXXXX, where XXXX is the last 4 characters of the hardware address of Ethernet Port 1. There is a 64-character limit (contiguous characters, no spaces). ***Note:*** *The host name becomes the prompt in the command line interface.*
Domain	If desired, specify a domain name (for example, support.lantronix.com). The domain name is used for host name resolution within the SLC. For example, if **abcd** is specified for the SMTP server, and **mydomain.com** is specified for the domain, if **abcd** cannot be resolved, the SLC attempts to resolve **abcd.mydomain.com** for the SMTP server.
Time Zone	If the time zone displayed is incorrect, enter the correct time zone and press **Enter**. If the entry is not a valid time zone, the system guides you through selecting a time zone. A list of valid regions and countries displays. At the prompts, enter the correct region and country.
Date/Time	If the date and time displayed are correct, type **n** and continue. If the date and time are incorrect, type **y** and enter the correct date and time in the formats shown at the prompts.
Sysadmin password	Enter a new sysadmin password.

After you complete the Quick Setup script, the changes take effect immediately.

Figure 4-3. Completed Quick Setup

```
Quick Setup will now step you through configuring a few basic settings.

The current settings are shown in brackets ('[]').
You can accept the current setting for each question by pressing <return>.

____Ethernet Port and Default Gateway_____________________________________
The SLC48 has two ethernet ports, Eth1 and Eth2.
By default, both ports are configured for DHCP.
Configure Eth1:  (1) obtain IP Address from DHCP
                 (2) obtain IP Address from BOOTP
                 (3) static IP Address
Enter 1-3: [1]

The SLC48 can be configured to use a default gateway.
Enter gateway IP Address: [none]

____Hostname_____________________________________________________________
The current hostname is 'slc', and the current domain is '<undefined>'.
The hostname will be shown in the CLI prompt.
Specify a hostname: [slc]
Specify a domain: [<undefined>]

____Time Zone____________________________________________________________
The current time zone is 'UTC'.
Enter time zone: [UTC]

____Date/Time____________________________________________________________
The current time is Tue Apr 18 15:29:26 2006
Change the current time? [n]

____Sysadmin Password____________________________________________________
Enter new password: [<current password>]

Quick Setup is now complete.
```

5. To logout, type **logout** at the prompt and press **Enter**.

Next Step

After quick starting the SLC, you may want to configure other settings. You can use the web page or the command line interface for configuration.

- For information about the web and the command line interfaces, go to *5: Web and Command Line Interfaces*.
- To continue configuring the SLC, go to *6: Basic Parameters*.

5: Web and Command Line Interfaces

The SLC offers three interfaces for configuring the SLC: a command line interface (CLI), a web interface, and an LCD with pushbuttons on the front panel. This chapter discusses the web and command line interfaces. (*4: Quick Setup* includes instructions for using the LCD to configure basic network settings.)

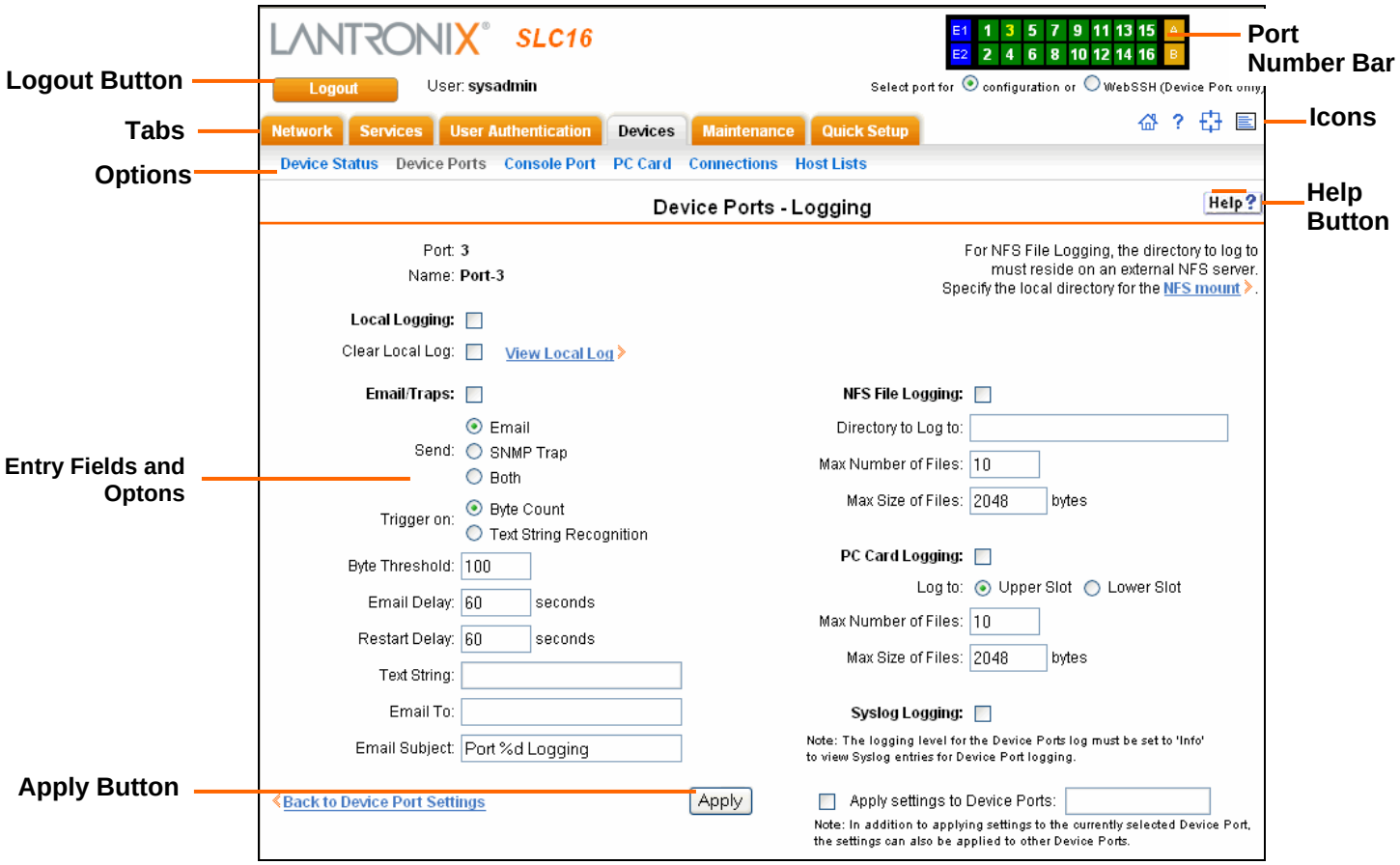
Web Interface

A web interface allows the system administrator and other authorized users to configure and manage the SLC using most web browsers (Netscape Navigator 6.x and above or Internet Explorer 5.5. and above, with JavaScript enabled). The Web Telnet and Web SSH features require Java 1.1 (or later) support in the browser. The SLC provides a secure, encrypted web interface over SSL (secure sockets layer).

Note: *The web server listens for requests on the unencrypted (HTTP) port (port 80) and redirects all requests to the encrypted (HTTPS) port (port 443).*

The following figure shows a typical web page:

Figure 5-1. Web Page Layout



The web page has the following components:

Tabs: Groups of settings to configure.

Options: Below each tab are options for specific types of settings.

Note: *Only those options for which the currently logged-in user has rights display.*

Port Number Bar: Allows you to select a port and display its settings. The **E1** and **E2** buttons display the Network – Settings page. The **A** and **B** buttons display the status of the power supplies.

Note: *Only ports to which the currently logged-in user has rights are enabled.*

Entry Fields and Options: Allow you to enter data and select options for the settings.

Note: *For specific instructions on completing the fields on the web pages, see Chapters 6 through 12.*

Apply Button: Apply on each web page makes the changes immediately and saves them so they will be there when the SLC is rebooted.

Icons: The icons in the icon bar above the Main Menu  display (from left to right):

- Home page.
- Information about the SLC and Lantronix contact information.
- Configuration site map.
- Status of the SLC.

Help Button: Provides online Help for the specific web page.

Logout Button: Closes SLC.

Logging in

Only the system administrator or users with web access rights can log into the web page. More than one user at a time can log in, but the same user cannot login more than once.

To log in to the SLC web interface:

1. Open a web browser (Netscape Navigator 6.x and above or Internet Explorer 5.5. and above).
2. In the URL field, type **https://** followed by the IP address of your SLC.
3. To configure the SLC, use **sysadmin** as the user name and **PASS** as the password. (These are the default values.)

   Notes:

   - *The administrator may have changed the password using the method described in the previous chapter.*
   - When SecurID over RADIUS is used, the user must enter the passcode corresponding to their RSA token. Depending on the state of the user, the login pages may also require a new PIN number, the next passcode, or the next tokencode.

   The Lantronix SLC Quick Setup page displays automatically the first time you log in. Subsequently, the Lantronix SLC Home page displays. (If you want to display the Quick Setup page again, click **Quick Setup** on the main menu.)

Logging off

To log off the SLC web interface:

Click the **Logoff** button. The “Logging out” message, followed by the login page displays.

Web Page Help

To view detailed information about an SLC web page:

Click the **Help** button to the right of the web page title.

Command Line Interface

A command line interface (CLI) is available for entering all the commands you can use with the SLC. In this User Guide, after each section of instructions for using the web interface, you will find the equivalent CLI commands. You can access the command line interface using Telnet, SSH, or a serial terminal connection.

Note: *By default, Telnet is disabled and SSH is enabled. To enable Telnet, use the Services web page, a serial terminal connection, or an SSH connection.*
(See 7: Services.)

The sysadmin user and users with who have full administrative rights have access to the complete command set, while all other users have access to a reduced command set based on their permissions.

Logging in

To log in to the SLC command line interface:

1. Do one of the following:
   - With a serial terminal connection, power up, and when the command line displays, press **Enter**.
   - If the SLC already has an IP address (assigned previously or assigned by DHCP), Telnet (if Telnet has been enabled) or SSH to **xx.xx.xx.xx** (the IP address in dot quad notation) and press **Enter**. The login prompt displays.
2. To log in as the system administrator for setup and configuration:
   a) Enter **sysadmin** as the user name and press **Enter**.
   b) Enter **PASS** as the password and press **Enter**. The first time you log in, the Quick Setup script runs automatically. Normally, the command prompt displays. (If you want to display the Quick Setup script again, use the `admin quicksetup` command.)

   Note: *The system administrator may have changed the password using one of the Quick Setup methods in the previous chapter.*
3. To log in any other user:
   a) Enter your SLC user name and press **Enter**.
   b) Enter your SLC password and press **Enter**.

Logging out

To log out of the SLC command line interface:

1. Type **logout** and press **Enter**.

Command Syntax

Commands have the following format:

`<action> <category> <parameter(s)>`

where

`<action>` is set, show, connect, admin, diag, pccard, or logout.

`<category>` is a group of related parameters whose settings you want to configure or view. Examples are ntp, deviceport, and network.

`<parameter(s)>` is one or more name-value pairs in one of the following formats:

`<parameter name> <aa|bb>`	User must specify one of the values (aa or bb) separated by a vertical line (|). The values are in all lowercase and must be entered exactly as shown. Bold indicates a default value.
`<parameter name> <Value>`	User must specify an appropriate value, for example, an IP address. The parameter values are in mixed case. Square brackets [ ] indicate optional parameters.

Table 5-1. Actions and Category Options

Action	Category
set	network | ipfilter | routing | datetime | ntp | services | nfs | cifs | menu | hostlist | auth | localusers | remoteusers | ldap | radius | kerberos | tacacs+ | consoleport | deviceport | nis | slcnetwork | command | sshkey | password | history | cli | locallog |
show	network | ipfilter | routing | datetime | ntp | services | nfs | cifs | menu | hostlist | auth | localusers | nis | ldap | radius | kerberos | tacacs+ | consoleport | deviceport | locallog | sysstatus | syslog | auditlog | portstatus | sysconfig | portcounters | connections | slcnetwork | sshkey | history | cli | user | remoteusers
connect	direct | listen | bidirection | unidirection | terminate | global
diag	ping | loopback | traceroute | arp | lookup | netstat | perfstat | sendpacket | nettrace | internals
pccard	storage | modem
admin	reboot | shutdown | ftp | config | firmware | version | banner | keypad | quicksetup | web | events |lcd
logout	Terminates CLI session.

Command Line Help

For general Help and to display the commands to which you have rights, type:

```
help
```

For general command line Help, type:

```
help command line
```

For more information about a specific command, type `help` followed by the command, for example:

`help set network` **or** `help admin firmware`

Tips

- Type enough characters to uniquely identify the action, category, or parameter name. For parameter values, type the entire value. For example, you can shorten:

  ```
  set network port 1 state static ipaddr 122.3.10.1 mask
  255.255.0.0
  ```

  to

  ```
  se net po 1 st static ip 122.3.10.1 ma 255.255.0.0
  ```

- Use the **Tab** key to automatically complete action, category, or parameter names. Type a partial name and press **Tab** either to complete the name if only one is possible, or to display the possible names if more than one is possible. Following a space after the preceding name, **Tab** displays all possible names.
- Should you make a mistake while typing, backspace by pressing the **Backspace** key and/or the **Delete** key, depending on how you accessed the interface. Both keys work if you use VT100 emulation in your terminal access program when connecting to the console port. Use the **left** and **right** arrow keys to move within a command.
- Use the **up** and **down arrows** to scroll through previously entered commands. If desired, select one and edit it. You can scroll through up to 100 previous commands entered in the session.
- To clear an IP address, type **`0.0.0.0`**, or to clear a non-IP address value, type **`CLEAR`**.

When the number of lines displayed by a command exceeds the size of the window (the default is 25), the command output is halted until the user is ready to continue. To display the next line, press **Enter**, and to display the page, press the space bar. You can override the number of lines (or disable the feature altogether) with the `set cli` command.

General CLI Commands

The following commands relate to the CLI itself.

To configure the current command line session:

```
set cli scscommands <enable|disable>
```

Allows you to use SCS-compatible commands as shortcuts for executing commands:

Note: *Settings are retained between CLI sessions for local users and users listed in the remote users list.*

SCS Commands	SLC Commands
info	'show sysstatus'
version	'admin version'
reboot	'admin reboot'
poweroff	'admin shutdown'
listdev	'show deviceport names'
direct	'connect direct deviceport'
listen	'connect listen deviceport'
clear	'set locallog clear'
telnet	'connect direct telnet'
ssh	'connect direct ssh'

To start a menu if a menu is associated with the current user and was not displayed at login:

```
set cli menu start
```

To set the number of lines displayed by a command:

```
set cli terminallines <disable|Number of lines>
```

Sets the number of lines in the terminal emulation (screen) for paging through text one screenful at a time, if the SLC cannot detect the size of the terminal automatically.

To show current CLI settings:

```
show cli
```

To view the last 100 commands entered in the session:

```
show history
```

To clear the command history:

```
set history clear
```

To view the rights of the currently logged-in user:

```
show user
```

Note: *For information about user rights, see 11: User Authentication.*

6: Basic Parameters

This chapter explains how to set the following basic configuration settings for the SLC using the SLC web interface or the CLI:

- Network parameters that determine how the SLC interacts with the attached network
- Firewall and routing
- Date and time

Note: *If you entered some of these settings using a Quick Setup procedure, you may update them here.*

Requirements

If you assign a different IP address from the current one, it must be within a valid range, unique to your network, and with the same subnet mask as your workstation.

To configure the unit, you need the following information:

Eth1

IP address: _____. _____ . _____ ._____

Subnet mask: _____. _____ . _____ ._____

Eth2

IP address (optional): _____. _____ . _____ ._____

Subnet mask (optional): _____. _____ . _____ ._____

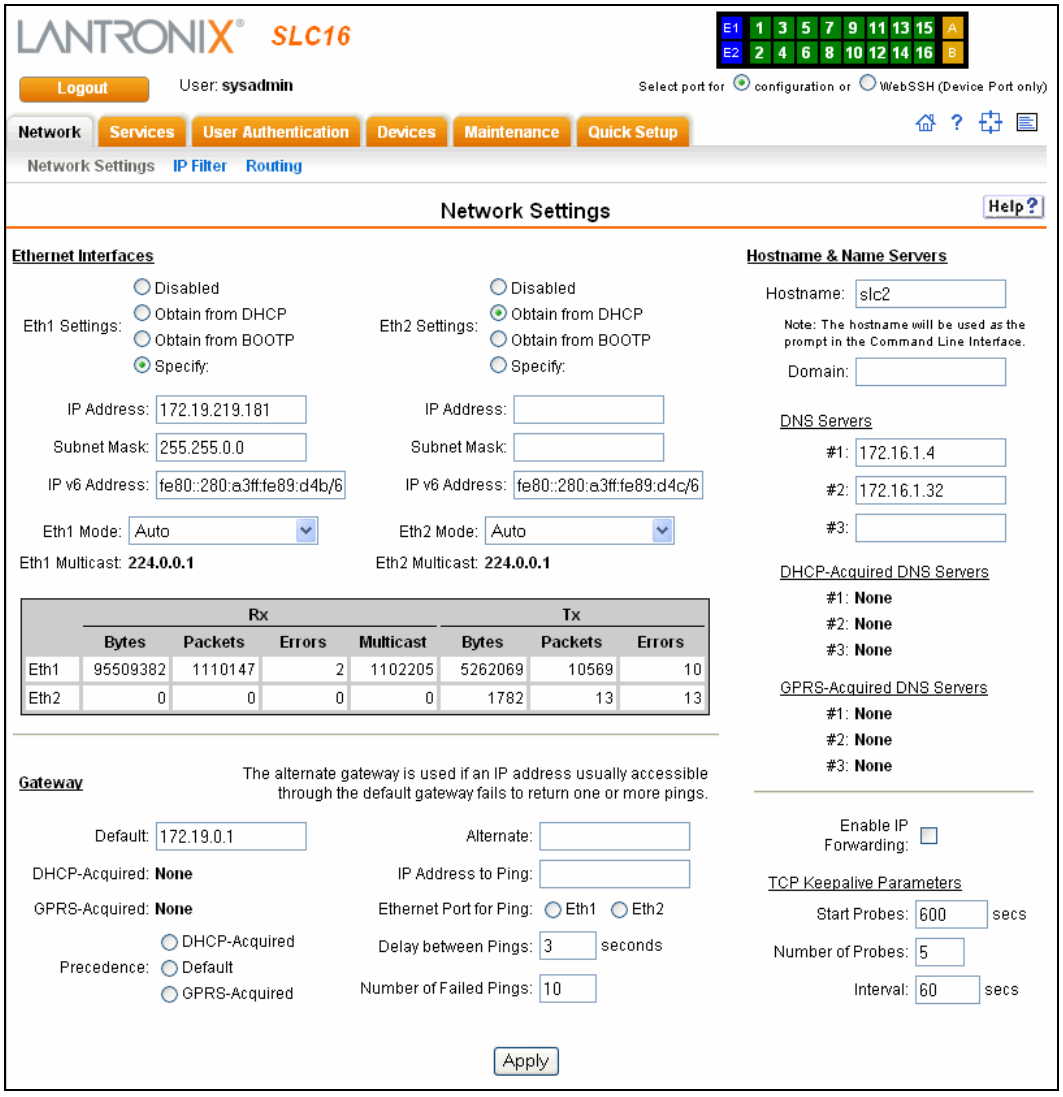
Gateway: _____. _____ . _____ ._____

DNS: _____. _____ . _____ ._____

Network Settings

To enter settings for one or both network ports:

1. Click the **Network** tab and select the **Network Settings** option. The following page displays:



2. Enter the following information:

Eth1 and Eth2 Settings

Note: *Configurations with the same IP subnet on multiple interfaces (Ethernet or PPP) are not currently supported.*

Eth 1 and/or Eth 2 Settings	**Disabled:** If selected, disables the network port. Defaults are Eth1 and Eth2 enabled. **Obtain from DHCP:** Acquires IP address, subnet mask, hostname and gateway from the DHCP server. (The DHCP server may not provide the hostname gateway, depending on its setup.) This is the default setting. If you select this option, skip to **Gateway**. **Obtain from BOOTP:** Lets a network node request configuration information from a BOOTP "server" node. If you select this option, skip to **Gateway**. **Specify:** Lets you manually assign a static IP address, generally provided by the system administrator.
IP Address (if specifying)	Enter an IP address that will be unique and valid on your network. There is no default. Enter all IP addresses in dot-quad notation. Do not use leading zeros in the fields for dot-quad numbers less than 100. For example, if your IP address is 172.19.201.28, do not enter 028 for the last segment. ***Note:*** *Currently, the SLC does not support configurations with the same IP subnet on multiple interfaces (Ethernet or PPP).*
Subnet Mask	If specifying an IP address, enter the network segment on which the SLC resides. There is no default.
Eth 1 and/or Eth2 IPv6 Address	Address of the port in IPv6 format. ***Note:*** *The SLC supports IPv6 connections for a limited set of services: the web, ssh, and Telnet.* IPv6 addresses are written as 8 sets of 4-digit hexadecimal numbers separated by colons. There are several rules for modifying the address. For example, 1234:0BCD:1D67:0000:0000:8375:BADD:0057 may be shortened to 1234:BCD:1D67::8375:BADD:57.
Eth 1 and/or Eth2 Mode	Select the direction (full duplex or half-duplex) and speed (10 or 100Mbit) of data transmission. The default is **Auto**, which allows the Ethernet port to auto-negotiate the speed and duplex with the hardware endpoint to which it is connected.
Eth 1 and/or Eth2 Multicast	Displays the multicast address of the Ethernet port.

Gateway

Default	IP address of the router for this network. If this has not been set manually, any gateway acquired by DHCP for Eth1 or Eth2 displays. All network traffic that matches the Eth1 IP address and subnet mask is sent out Eth1. All network traffic that matches the Eth2 IP address and subnet mask is sent out Eth 2. If you set a default gateway, any network traffic that does not match Eth1 or Eth2 is sent to the default gateway for routing.
DHCP-Acquired (view only)	Gateway acquired by DHCP for Eth1 or Eth2.
GPRS-Acquired (view only)	Displays the IP address of the router if it has been automatically assigned by General Packet Radio Service (GPRS).
Precedence	Indicates whether the gateway acquired by DHCP or the default gateway takes precedence. The default is DHCP Gateway. If the DHCP Gateway is selected and both Eth1 and Eth2 are configured for DHCP, the SLC gives precedence to the Eth1 gateway.
Alternate	An alternate IP address of the router for this network, to be used if an IP address usually accessible through the default gateway fails to return one or more pings.
IP Address to Ping	IP address to ping to determine whether to use the alternate gateway.
Ethernet Port to Ping	Ethernet port to use for the ping.
Delay between Pings	Number of seconds between pings
Number of Failed Pings	Number of pings that fail before the SLB uses the alternate gateway.
Enable IP Forwarding	IP forwarding enables network traffic received on one interface (Eth1, Eth2, or an external/PC Card modem attached to the SLC with an active PPP connection) to be transferred out another interface (any of the above). The default behavior (if IP forwarding is disabled) is for network traffic to be received but not routed to another destination. Enabling IP forwarding is required if you enable Network Address Translation (NAT) for any device port modem or PC Card/ISDN modem. IP forwarding allows a user accessing the SLC over a modem to access the network connected to Eth1 or Eth2.

Hostname & Name Servers

Hostname	The default host name is slcXXXX, where XXXX is the last 4 characters of the hardware address of Ethernet Port 1. There is a 64-character limit (contiguous characters, no spaces). The host name becomes the prompt in the command line interface.
Domain	If desired, specify a domain name (for example, support.lantronix.com). The domain name is used for host name resolution within the SLC. For example, if **abcd** is specified for the SMTP server, and **mydomain.com** is specified for the domain, if **abcd** cannot be resolved, the SLC attempts to resolve **abcd.mydomain.com** for the SMTP server.

DNS Servers

DNS Servers #1 - #3	Configure up to three name servers. #1 is required if you choose to configure DNS (Domain Name Server) servers. The first three DNS servers acquired via DHCP through Eth1 and/or Eth2 display automatically.

DHCP-Acquired DNS Servers

#1 - #3	Displays the IP address of the name servers if automatically assigned by DHCP.

GPRS-Acquired DNS Servers

#1 - #3	Displays the IP address of the name servers if automatically assigned by General Packet Radio Service (GPRS).

TCP Keepalive Parameters

Start Probes	Number of seconds the SLC waits after the last transmission before sending the first probe to determine whether a TCP session is still alive. The default is **600** seconds (10 minutes).
Number of Probes	Number of probes the SLC sends before closing a session. The default is **5**.
Interval	The number of seconds the SLC waits between probes. The default is **60** seconds.

3. To save your entries, click the **Apply** button. **Apply** makes the changes immediately and saves them so they will be there when the SLC is rebooted.

Ethernet Counters

The Network-Settings page displays statistics for each of the SLC's Ethernet ports since boot-up. The system automatically updates them.

Note: *For Ethernet statistics for a smaller time period, use the* `diag perfstat` *command.*

Ethernet Counters							
	Rx				Tx		
	Bytes	Packets	Errors	Multicast	Bytes	Packets	Errors
Eth1	1267404	15521	0	15335	0	254	0
Eth2	0	0	0	0	0	2	2

Network Commands

The following CLI commands correspond to the web page entries described above.

To set the default and alternate network gateways:

```
set network gateway <parameters>
```

Parameters:

```
default <IP Address>
precedence <dhcp|gprs|default>
alternate <IP Address>
pingip <IP Address>
ethport <1 or 2>
pingdelay <1-250 seconds>
failedpings <1-25>
```

The alternate gateway is used if an IP address usually accessible through the default gateway fails to return one or more pings.

To configure Ethernet port 1 or 2:

```
set network port <1|2> <parameters>
```

Parameters:

```
mode <auto|10mbit-half|100mbit-half|
10mbit-full|100mbit-full>

state <dhcp|bootp|static|disable>
[ipaddr <IP Address> mask <Mask>]

[ipv6addr <IP v6 Address|Prefix>]
```

To configure up to three DNS servers:

```
set network dns <1|2|3> ipaddr <IP Address>
```

To set the default gateway:

```
set network gateway <parameters>
```

Parameters:

```
default <IP Address>
precedence <dhcp|default>
```

To set the SLC host name and domain name:

```
set network host <Hostname> [domain <Domain Name>]
```

To set TCP Keepalive and IP Forwarding network parameters:

```
set network <parameters>
```

Parameters:

```
interval <1-99999 Seconds>
ipforwarding <enable|disable>
probes <Number of Probes>
startprobes <1-99999 Seconds>
```

To view all network settings:

```
show network all
```

To view Ethernet port settings and counters:

```
show network port <1|2>
```

To view DNS settings:

```
show network dns
```

To view gateway settings:

```
show network gateway
```

To view the host name of the SLC:

```
show network host
```

IP Filter

IP filters (also called a rule set) act as a firewall to allow or deny individual or a range of IP addresses, ports, and protocols. When a network connection is configured to use an IP filter, all network traffic through that connection is compared, in order, to the rules of that filter. Network traffic may be allowed to pass, it may be dropped (without notice), or it may be rejected (sends back an error packet) depending upon the rules of that filter rule set.

The administrator uses the Network – IP Filter page to view, add, edit, delete, and map IP filters,

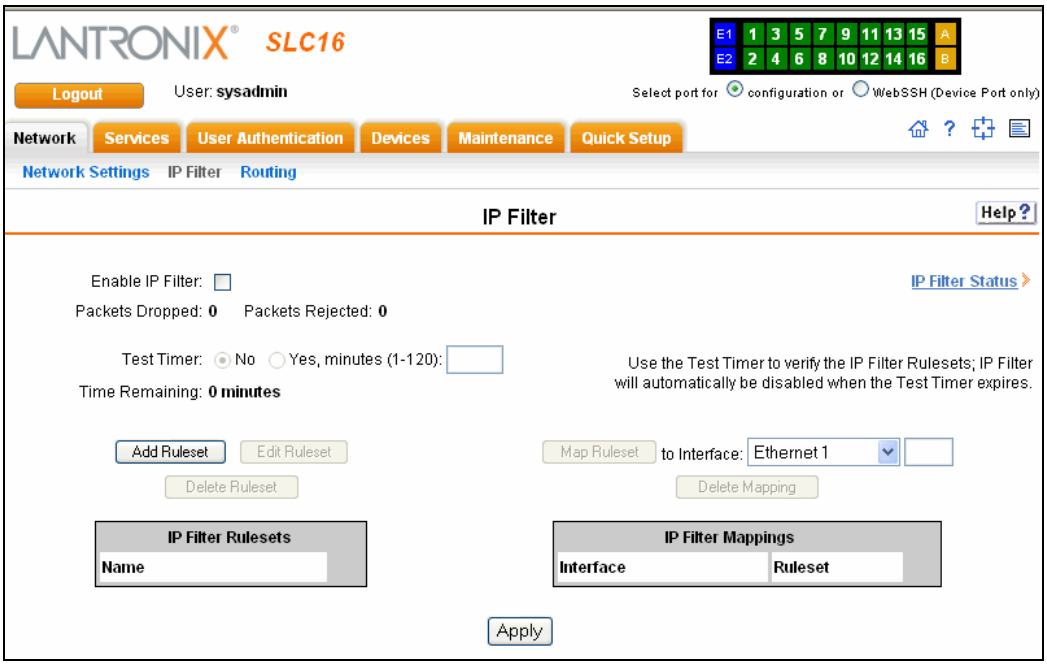
> ***Warning:* IP filters configuration is a feature for advanced users. Adding and enabling IP filter sets incorrectly can disable your SLC.**

Viewing IP Filters

You can view a list of filters and a table showing how each filter is mapped to an interface.

To view a list of IP filters:

1. Click the **Network** tab and select the **IP Filter** option. The following page displays:



Enabling IP Filters

On the IP Filter page, you can enable all filters or disable all filters.

Note: *There is no way to enable or disable individual filters.*

To enable IP filters:

1. Enter the following:

Enable IP Filter	Select the **Enable IP Filter** checkbox to enable all filters, or clear the checkbox to disable all filters. Disabled by default.
Packets Dropped (view only)	Displays the number of data packets that the filter ignored (did not respond to).
Packets Rejected (view only)	Displays the number of data packets that the filter sent a "rejected" response to.
Test Timer	Timer for testing IP Filter rulesets. Select **No** to disable the timer. **Select Yes, minutes (1-120)** to enable the timer and enter the number of minutes the timer should run. The timer automatically disables the IP Filters when the time expires.
Time Remaining (view only)	Indicates how many minutes are left on the timer before it expires and IP Filters are disabled.

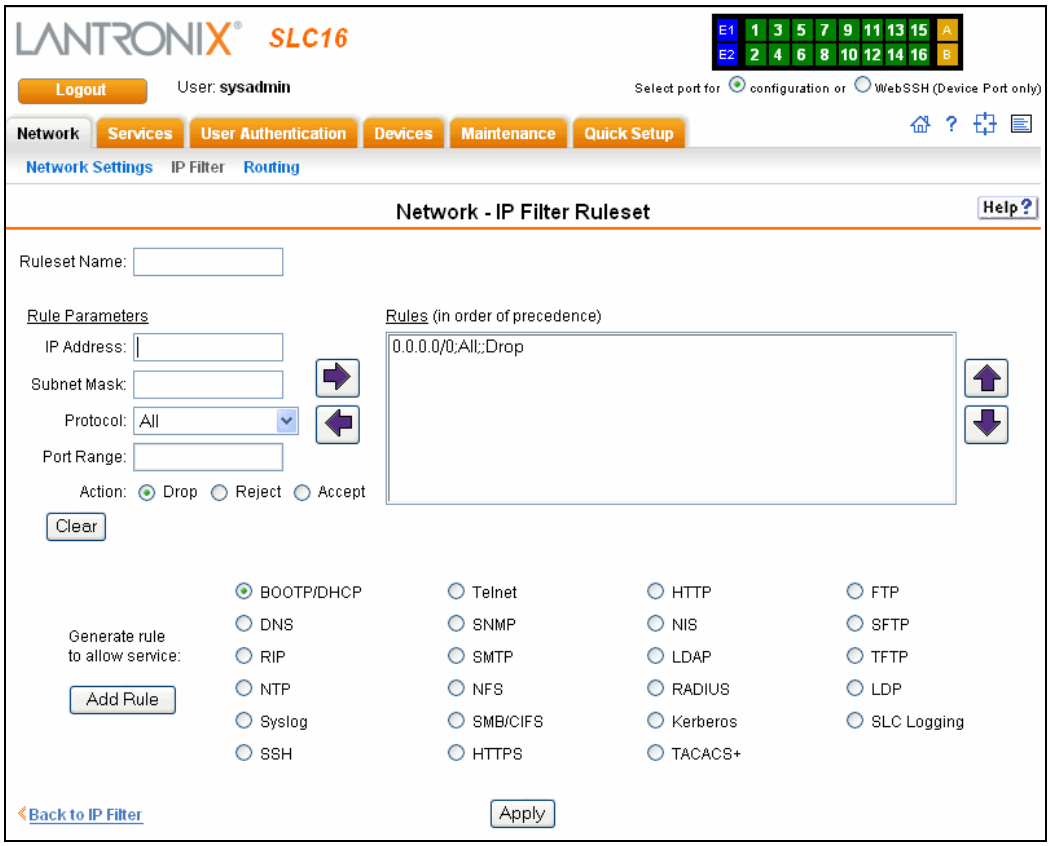
Configuring IP Filters

The administrator can add, edit, delete, and map IP filters.

Note: *A configured filter has no effect until it is mapped to a network interface. See* *Mapping a Rule Set on page 51.*

To add an IP filter:

1. On the IP Filter page, click the **Add Ruleset** button. The following page displays:



2. Enter the following

Ruleset Name	Name that identifies a filter; may be composed of letters, numbers, and hyphens only. (The name cannot start with a hyphen.) **Example:** FILTER-2

Rule Parameters

IP Address	Specify a single IP address to act as a filter. **Example:** 172.19.220.64 – this specific IP address only
Subnet Mask	Specify a subnet mask to act as a filter. **Example:** 255.255.0.0
Protocol	From the drop-down list, select the type of protocol through which the filter will operate. The default setting is **All**.

Port Range	Enter a range of destination TCP or UDP port numbers to be tested. An entry is required for TCP, TCP New, TCP Established, and UDP, and is not allowed for other protocols. Separate multiple ports with commas. Separate ranges of ports by colons. **Examples:** 22 – filter on port 22 only 23,64,80 – filter on ports 23, 64 and 80 23:64,80,143:150 – filter on ports 23 through 64, port 80 and ports 143 through 150
Action	Select whether to drop, reject, or allow communications for the specified IP address, subnet mask, protocol, and port range. **Drop** ignores the packet with no notification. **Reject** ignores the packet and sends back an error message. **Allow** permits the packet through the filter.
Generate rule to allow service	You may wish to "punch holes" in your filter set for a particular protocol or service. For instance, if you have configured your NIS server and wish to create an opening in your filter set, select the **NIS** option and click the **Add Rule** button. This entry adds a new rule to your filter set using the NIS -configured IP address. Other services and protocols added automatically generate the necessary rule to allow their use.

3. Click the **right arrow** button to add the new rule to the bottom of the **Rules** list box on the right.
4. To remove a rule from the filter set, highlight that line and click the **left arrow**. The rule populates the rule definition fields, allowing you to make minor changes before reinserting the rule. To clear the definition fields, click the **Clear** button.
5. To change the order of priority of the rules in the list box, select the rule to move and use the **up** or **down arrow** buttons on the right side of the filter list box.
6. To save, click the **Apply** button. The new filter displays in the menu tree.

Note: *To add another new filter rule set, click the* ***Back to IP Filter*** *link to return to the IP Filter page.*

Updating an IP Filter

The administrator can update an IP filter rule set.

1. On the IP Filter page, select the IP filter ruleset to be edited and click the **Edit Ruleset** button. The IP Filter Ruleset page displays.
2. Edit the information as desired and click the **Apply** button.

Deleting an IP Filter

The administrator can delete an IP filter rule set.

1. On the IP Filter page, select the IP filter ruleset to be deleted and click the **Delete** button.

Mapping a Rule Set

The administrator can assign an IP Filter Rule Set to a network interface (Ethernet interface), a modem connected to a Device Port, or a PC Card modem.

To map a rule set to a network interface:

1. On the IP Filter page, select the IP filter rule set to be mapped.
2. From the **Interface** drop-down list, select the interface and click the **Map Ruleset** button. The Interface and rule set display in the IP Filter Mappings table.

To delete a mapping:

1. On the IP Filter page, select the mapping from the list and click the **Delete Mappings** button. The mapping no longer displays.
2. Click the **Apply** button.

IP Filter Commands

The following CLI commands correspond to the web page entries described above.

To enable or disable IP filtering for incoming network traffic:

```
set ipfilter state
```

To set IP filter mapping:

```
set ipfilter mapping <parameters>
```

Parameters:

```
ethernet <1|2> state <disable>
ethernet <1|2> state <enable> ruleset <Ruleset Name>
deviceport <1..48> state <disable>
deviceport <1..48> state <enable> ruleset <Ruleset
Name>
pccardslot <upper|lower> state <disable>
pccardslot <upper|lower> state <enable> ruleset
<Ruleset Name>
```

To set IP filter rules:

```
set ipfilter rules <parameters>
```

Parameters:

```
add <Ruleset Name>
delete <Ruleset Name>

edit <Ruleset Name> <Edit Parameters>
```

Edit Parameters:

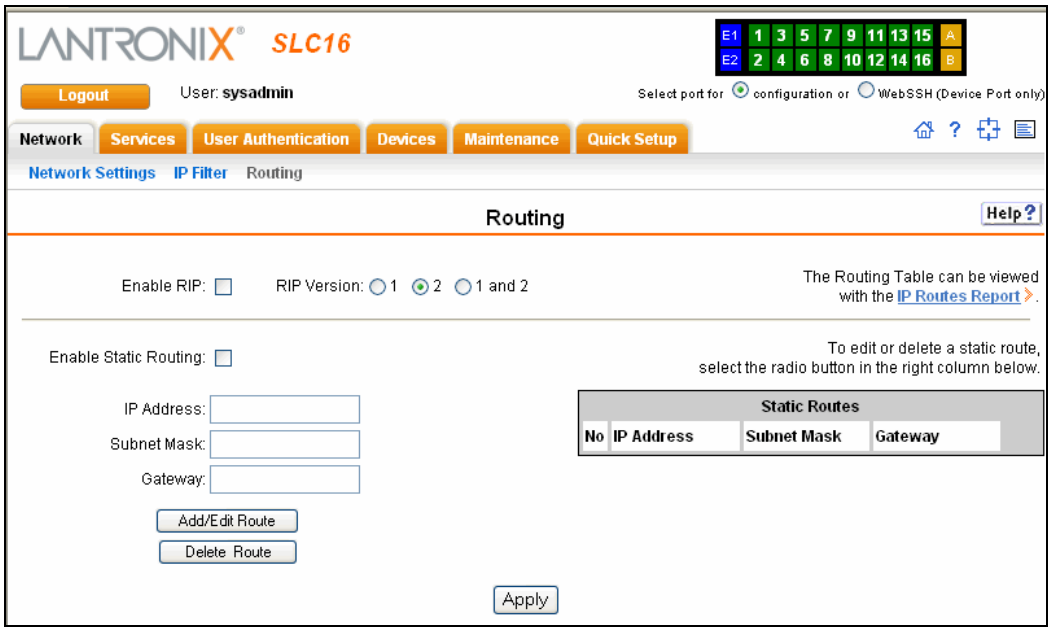
```
append
insert <Rule Number>
replace <Rule Number>
delete <Rule Number>
```

Routing

The SLC allows you to define static routes and, for networks using Routing Information Protocol (RIP)-capable routes, to enable the RIP protocol to configure the routes dynamically.

To configure routing settings:

1. Click the **Network** tab and select the **Routing** option. The following page displays:



2. Enter the following:

Dynamic Routing

Enable RIP	Select to enable Dynamic Routing Information Protocol (RIP) to assign routes automatically. Disabled by default.
RIP Version	Select the RIP version. The default is **2**.

Static Routing

Enable Static Routing	Select to assign the routes manually. The system administrator usually provides the routes. Disabled by default. ◆ To add a static route, enter the **IP Address**, **Subnet Mask**, and **Gateway** for the route and click the **Add/Edit Route** button. The route displays in the Static Routes table. You can add up to 64 static routes. ◆ To edit a static route, select the radio button to the right of the route, change the **IP Address**, **Subnet Mask**, and **Gateway** fields as desired, and click the **Add/Edit Route** button. ◆ To delete a static route, select the radio button to the right of the route and click the **Delete Route** button.

3. Click the **Apply** button.

   Note: *To display the routing table, click the **IP Routes Report** link. The Status/Reports page displays. To view the report, select the **IP Routes** checkbox and click **Generate Report**.*

Routing Commands

The following CLI commands correspond to the web page entries described above.

To configure static or dynamic routing:

```
set routing [parameters]
```

Parameters:

```
rip <enable|disable>
route <1-64> ipaddr <IP Address> mask <Netmask>
gateway <IP Address>
static <enable|disable>
version <1|2|both>
```

Note: *To delete a static route, set the IP address, mask, and gateway parameters to **0.0.0.0**.*

To set the routing table to display IP addresses (disable) or the corresponding host names (enable):

```
show routing [resolveip <enable|disable>] [email <Email Address>]
```

Note: *You can optionally email the displayed information.*

7: Services

Use the Services page to:

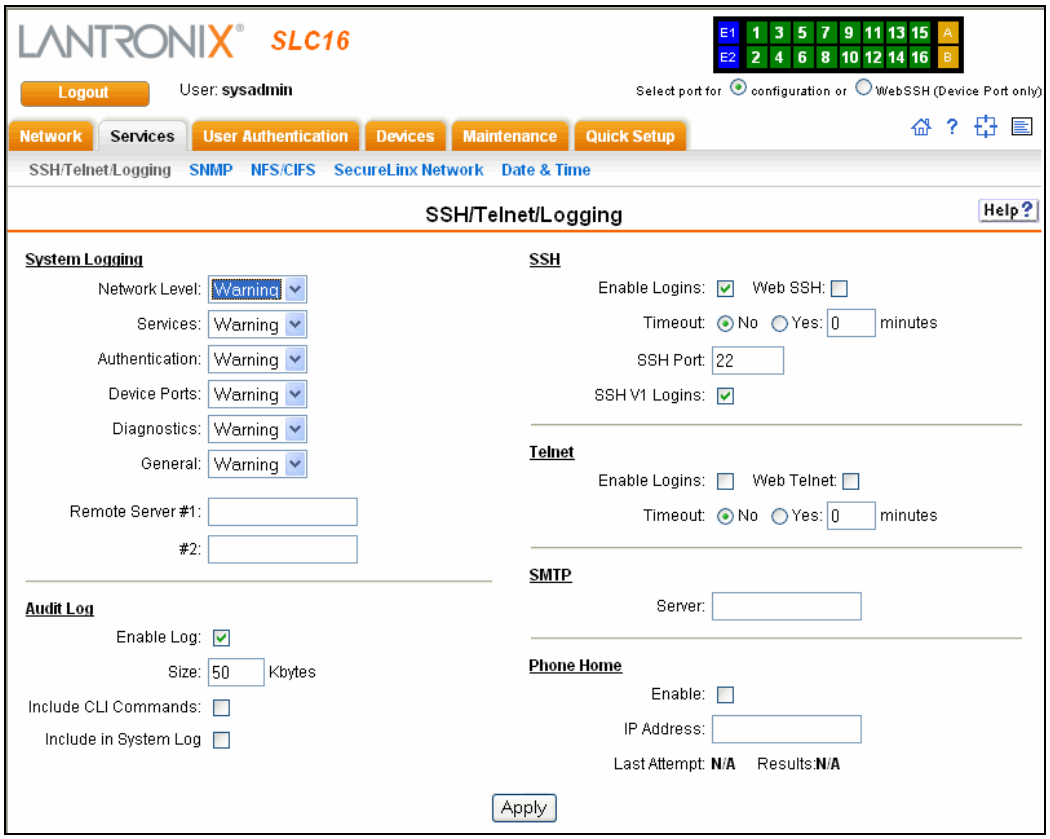
- Configure the amount of data sent to the logs.
- Enable or disable SSH and Telnet logins.
- Enable a Simple Network Management Protocol (SNMP) agent.

  Note: *The SLC supports both MIB-II (as defined by RFC 1213) and a private enterprise MIB. The SLC product CD includes the MIB definition files for the private enterprise MIB. The private enterprise MIB provides read-only access to all statistics and configurable items provided by the SLC. It provides read-write access to a select set of functions for controlling the SLC and device ports. See the MIB definition file for details.*
- Identify a Simple Mail Transfer Protocol (SMTP) server.
- Enable or disable SSH and Telnet logins.
- Configure an audit log.
- View the status of and manage the SLCs on the SecureLinx network.
- Set the date and time.

SSH/Telnet/Logging

To configure SSH, Telnet, and Logging settings:

1. Click the **Services** tab and select the **SSH/Telnet /Logging** option. The following page displays.



2. Enter the following settings:

System Logging

In the System Logging section, select one of the following alert levels from the drop-down list for each message category:

- **Off:** Disables this type of logging.
- **Info:** Saves informative message, in addition to warning and error messages.
- **Warning:** Saves message output from a condition that may be cause for concern, in addition to error messages. This is the default for all message types.
- **Error:** Saves messages that are output because of an error.
- **Debug:** Saves extraneous detail that may be helpful in tracking down a problem, in addition to information, warning, and error messages.

Network Level	Messages concerning the network activity, for example about Ethernet and routing.
Services	Messages concerning services such as SNMP and SMTP.
Authentication	Messages concerning user authentication.
Device Ports	Messages concerning device ports and connections.
Diagnostics	Messages concerning system status and problems.
General	Any message not in the categories above.

Remote Servers (#1 and #2)	IP address of the remote server(s) where system logs are stored. The system log is always saved to local SLC storage. It is retained through SLC reboots for files up to 200K. Saving the system log to a server that supports remote logging services (see RFC 3164) allows the administrator to save the complete system log history.

SSH

Enable Logins	Enables or disables SSH logins to the SLC to allow users to access the CLI using SSH. Enabled by default. This setting does not control SSH access to individual device ports. (See *Device Ports – Settings* on page 76 for information on enabling SSH access to individual ports.) Most system administrators enable SSH logins, which is the preferred method of accessing the system.
Web SSH	Enables or disables the ability to access the SLC command line interface or device ports (connect direct) through the Web SSH window. Disabled by default.
Timeout	If you enable SSH logins, you can cause an idle connection to disconnect after a specified number of minutes. Select **Yes** and enter a value of from 1 to 30 minutes. ***Note:*** *You must reboot the unit before a change will take effect.*
SSH Port	Allows you to change the SSH login port to a different value in the range of **1 - 65535**. The default is **22**. ***Note:*** *You must reboot the unit before a change will take effect.*
SSH V1 Logins	Enables or disables SSH version 1 connections to the SLC. Enabled by default. ***Note:*** *Disabling SSH V1 blocks Web SSH CLI and Web SSH to device port connections on the SLC Network page. Also, you must reboot the SLC before a change will take effect.*

Telnet

Enable Logins	Enables or disables Telnet logins to the SLC to allow users to access the CLI using Telnet. Disabled by default. This setting does not control Telnet access to individual device ports. (See *Device Ports – Settings* on page 76 for information on enabling Telnet access to individual ports.) You may want to keep this option disabled for security reasons.

Web Telnet	Enables or disables the ability to access the SLC command line interface or device ports (connect direct) through the Web Telnet window. Disabled by default.
Timeout	If you enable Telnet logins, you can cause an idle connection to disconnect after a specified number of minutes. Select **Yes** and enter a value of from 1 to 30 minutes. ***Note:*** *You must reboot the unit before a change will take effect.*

Audit Log

Enable Log	Select to save a history of all configuration changes in a circular log. Disabled by default. The audit log is saved through SLC reboots.
Size	The log has a default maximum size of **50** Kbytes (approximately 500 entries). You can set the maximum size of the log from 1 to 500 Kbytes.
Include CLI Commands	Select to cause the audit log to include the CLI commands that have been executed. Disabled by default.
Include In System Log	If enabled, the contents of the audit log are added to the system log (under the General/Info category/level). Disabled by default.

SMTP

Server	IP address of your network's Simple Mail Transfer Protocol (SMTP) relay server.

Phone Home

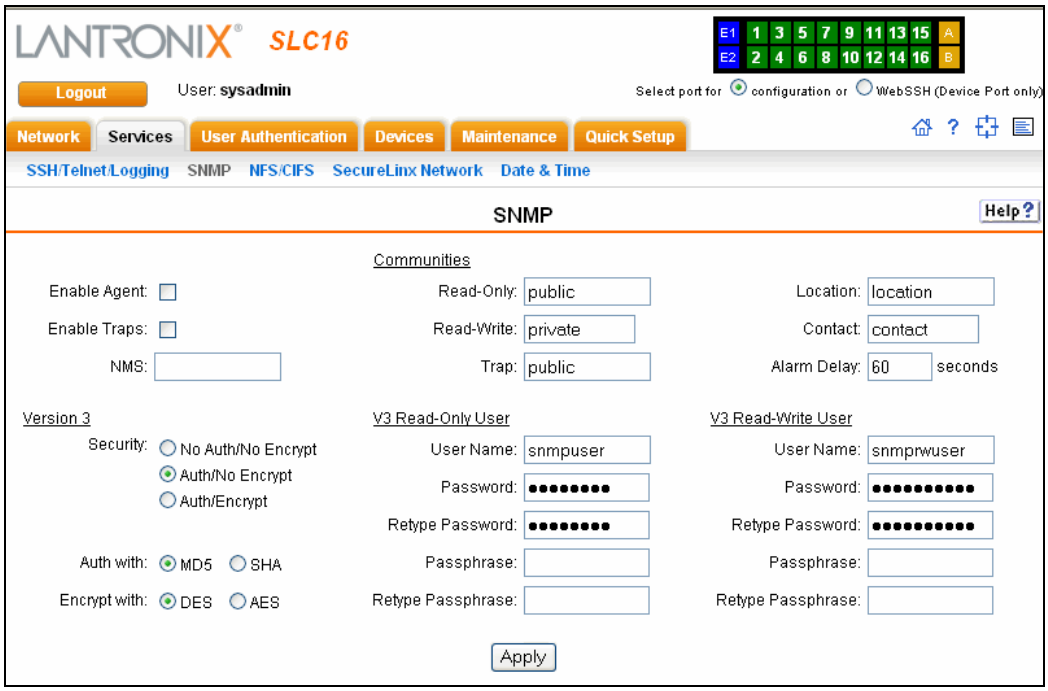
Enable	If enabled, the SLC will attempt to phone home every hour until it has contacted an SLM and provided it with its configuration.
IP Address	IP address of the SLM.
Last Attempt (view only)	Date and time of last connection attempt.
Results (view only)	Indicates whether the attempt was successful.

3. To save, click the **Apply** button.

SNMP

Simple Network Management Protocol (SNMP) is a set of protocols for managing complex networks.

1. Click the **Services** tab and select the **SNMP** option. The following page displays:



2. Enter the following:

Enable Agent	Enables or disables SNMP agent, which allows read-only access to the system. Disabled by default.
Enable Traps	Traps are notifications of certain critical events. Disabled by default. This feature is applicable when SNMP is enabled. Examples of traps that the SLC sends include: ◆ Ethernet Port Link Up ◆ Ethernet Port Link Down ◆ Authentication Failure ◆ SLC Booted ◆ SLC Shutdown ◆ Device Port Logging ◆ Power Supply Status ◆ Sysadmin user password changed The SLC sends the traps to the host identified in the **NMS** field.

NMS	When SNMP is enabled, an NMS (Network Management System) acts as a central server, requesting and receiving SNMP-type information from any computer using SNMP. The NMS can request information from the SLC and receive traps from the SLC. Enter the IP address of the NMS server. Required if you selected **Enable Traps.**
Location	Physical location of the SLC (optional). Useful for managing the SLC using SNMP. Up to 20 characters.
Contact	Description of the person responsible for maintaining the SLC, for example, a name (optional). Up to 20 characters.
Alarm Delay	Number of seconds delay between outgoing SNMP traps.

Communities

Trap	The trap used for outgoing generic and enterprise traps. Traps sent with the Event trigger mechanism still use the trap community specified with the Event action. The default is **public**.
Read-Only	A string that acts like a password for an SNMP manager to access the read-only data the SLC SNMP agent provides. The default is **public**.
Read-Write	A string that acts like a password for an SNMP manager to access the read-only data the SLC SNMP agent provides and to modify data where permitted. The default is **private**.

Version 3

Security	Levels of security available with SNMP v. 3. **No Auth/No Encrypt:** No authentication or encryption. **Auth/No Encrypt:** Authentication but no encryption. (default) **Auth/Encrypt:** Authentication and encryption.
Auth with	For **Auth/No Encryp** or **Auth/Encrypt**, the authentication method: **MD5:** Message-Digest algorithm 5 (default) **SHA:** Secure Hash Algorithm
Encrypt with	Encryption standard to use: **DES:** Data Encryption Standard (default) **AES:** Advanced Encryption Standard

V3 Read-Only User

User Name	SNMP v3 is secure and requires user-based authorization to access SLC MIB objects. Enter a user ID. The default is **snmpuser**. Up to 20 characters.
V3 Password/Retype Password	Password for a user with read-only authority to use to access SNMP v3. The default is **SNMPPASS**. Up to 20 characters.
Passphrase/ Retype Passphrase	Passphrase associated with the password for a user with read-only authority. Up to 20 characters.

V3 Read-Write User

User Name	SNMP v3 is secure and requires user-based authorization to access SLC MIB objects. Enter a user ID for users with read-write authority. The default is **snmprwuser**. Up to 20 characters.
V3 Password/Retype Password	Password for the user with read-write authority to use to access SNMP v3. The default is **SNMPRWPASS**. Up to 20 characters.
Passphrase/ Retype Passphrase	Passphrase associated with the password for a user with read-write authority. Up to 20 characters.

3. To save, click the **Apply** button.

SSH,Telnet, and Logging Commands

The following CLI commands correspond to the web page entries described above.

To configure services (system logging, SSH and Telnet access, SSH and Telnet timeout, SNMP agent, email (SMTP) server, and audit log):

```
set services <one or more services parameters>
```

Parameters:

```
alarmdelay <1-6000 Seconds>
auditlog <enable|disable>
auditsize <Size in Kbytes>
```
Range is 1-500 Kbytes.
```
authlog <off|error|warning|info|debug>
clicommands <enable|disable>
contact <Admin contact info>
devlog <off|error|warning|info|debug>
diaglog <off|error|warning|info|debug>
genlog <off|error|warning|info|debug>
includesyslog <enable|disable>
location <Physical Location>
```

```
netlog <off|error|warning|info|debug>
nms <IP Address or Name>
phonehome <enable|disable>
phoneip <IP Address>
portssh <TCP Port>
rocommunity <Read-Only Community Name>
rwcommunity <Read-Write Community Name>
servlog <off|error|warning|info|debug>
smtpserver <IP Address or Hostname>
snmp <enable|disable>
ssh <enable|disable>
syslogserver1 <IP Address or Name>
syslogserver2 <IP Address or Name>
telnet <enable|disable>
timeoutssh <disable or 1-30>
timeouttelnet <disable or 1-30>
traps <enable|disable>
trapcommunity <Trap Community>
v1ssh <enable|disable>
v3user <V3 RO User>
v3password <V3 RO User Password>
v3phrase <V3 RO User Passphrase>
v3rwuser <V3 RW User>
v3rwpassword <V3 RW User Password>
v3rwphrase <V3 RW User Passphrase>
v3security <noauth|auth|authencrypt>
v3auth <md5|sha>
v3encrypt <des|aes>
v3password <Password for v3 auth>
v3user <User for v3 auth>
webssh <enable|disable>
webtelnet <enable|disable>
```

To view current services:

```
show services
```

NFS and SMB/CIFS

Use the NFS & SMB/CIFS page if you want to save configuration and logging data onto a remote NFS server, or export configuration and logging data by means of an exported CIFS share.

Mounting an NFS shared directory on a remote network server onto a local SLC directory enables the SLC to store device port logging data on that network server. This configuration avoids possible limitations in the amount of disk space on the SLC available for the logging file(s). You may also save SLC configurations on the network server.

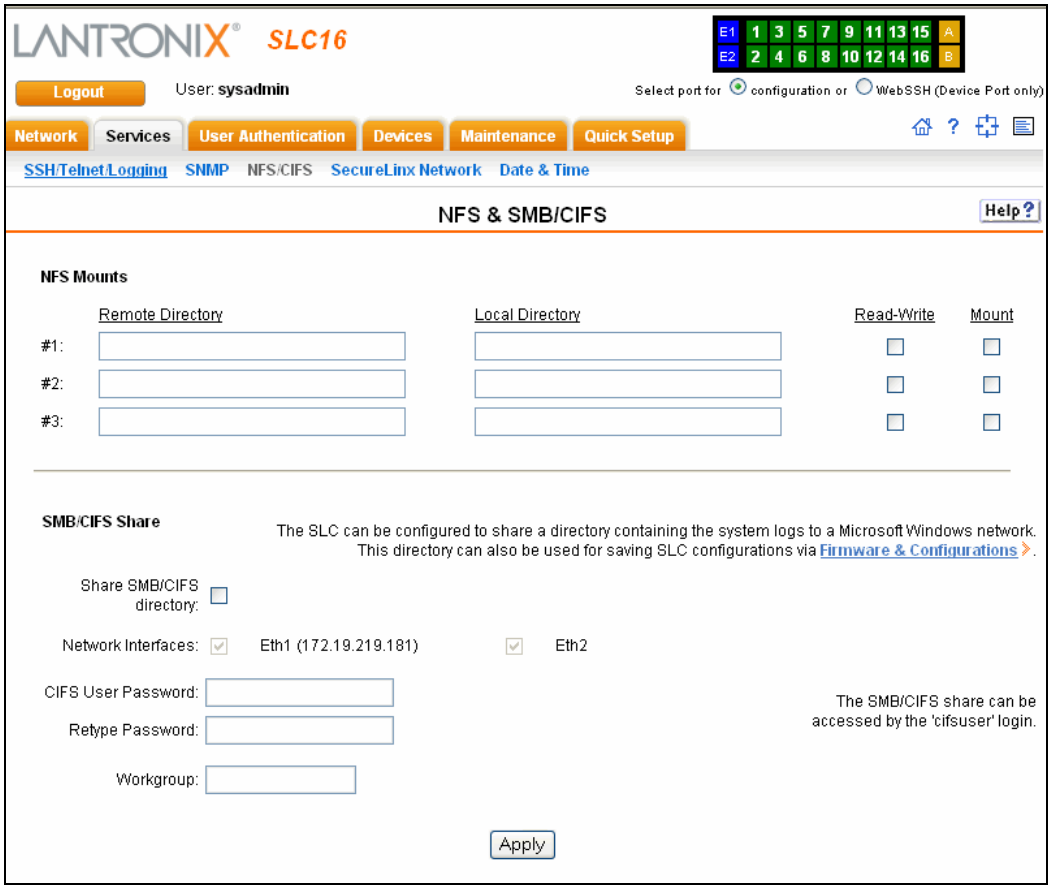
Similarly, use SMB/CIFS (Server Message Block/Common Internet File System), Microsoft's file-sharing protocol, to export a directory on the SLC as an SMB/CIFS share. The SLC exports a single read-write CIFS share called "public," with two subdirectories:

- The `logs` directory, which contains the system logs and the device port local buffers (see *System Logs* on page 180) and is read-only.
- The `config` directory, which contains saved configurations and is read-write.

The share allows users to access the contents of the directory or map the directory onto a Windows computer. Users can also access the device port local buffers from the CIFS share (see *Device Ports – Logging* on page 90).

To configure NFS and SMB/CIFS:

1. Click the Services tab and select the **NFS/CIFS** option. The following page displays:



2. Enter the following for up to three directories:

NFS Mounts

Remote Directory	The remote NFS share directory in the format: **nfs_server_hostname** or **ipaddr:/exported/path**
Local Directory	The local directory on the SLC on which to mount the remote directory. The SLC creates the local directory automatically.
Read-Write	If enabled, indicates that the SLC can write files to the remote directory. If you plan to log port data or save configurations to this directory, you must enable this option.
Mount	Select the checkbox to enable the SLC to mount the file to the NFS server. Disabled by default.

3. Enter the following:

SMB/CIFS Share

Share SMB/CIFS directory	Select the checkbox to enable the SLC to export an SMB/CIFS share called “public.” Disabled by default.
Network Interfaces	Select the network ports from which the share can be seen. The default is for the share to be visible on both network ports.
CIFS User Password/Retype Password	Only one user special username (cifsuser) can access the CIFS share. Enter the CIFS user password in both password fields. The default user password is **CIFSPASS**. More than one user can access the share with the **cifsuser** user name and password at the same time.
Workgroup	The Windows workgroup to which the SLC belongs. Every PC exporting a CIFS share must belong to a workgroup. Can have up to 15 characters.

4. To save, click the **Apply** button.

NFS and SMB/CIFS Commands

The following CLI commands correspond to the web page entries described above.

To mount a remote NFS share:

```
set nfs mount <one or more parameters>
```

Parameters:

```
locdir <Directory>
mount <enable|disable>
remdir <Remote NFS Directory>
rw <enable|disable>
```
Enables read/write access to remote directory.

Note: *The `remdir` and `locdir` parameters are required, but if you specified them previously, you do not need to provide them again.*

To unmount a remote NFS share:

```
set nfs unmount <1|2|3>
```

To view NFS share settings:

```
show nfs
```

To configure the SMB/CIFS share, which contains the system and device port logs:

```
set cifs <one or more parameters>
```

Parameters:

```
eth1 <enable|disable>
eth2 <enable|disable>
state <enable|disable>
workgroup <Windows workgroup>
```

Note: *The `admin config` command saves SLC configurations on the SMB/CIFS share.*

To change the password for the SMB/CIFS share login (default is cifsuser):

```
set cifs password
```

To view SMB/CIFS settings:

```
show cifs
```

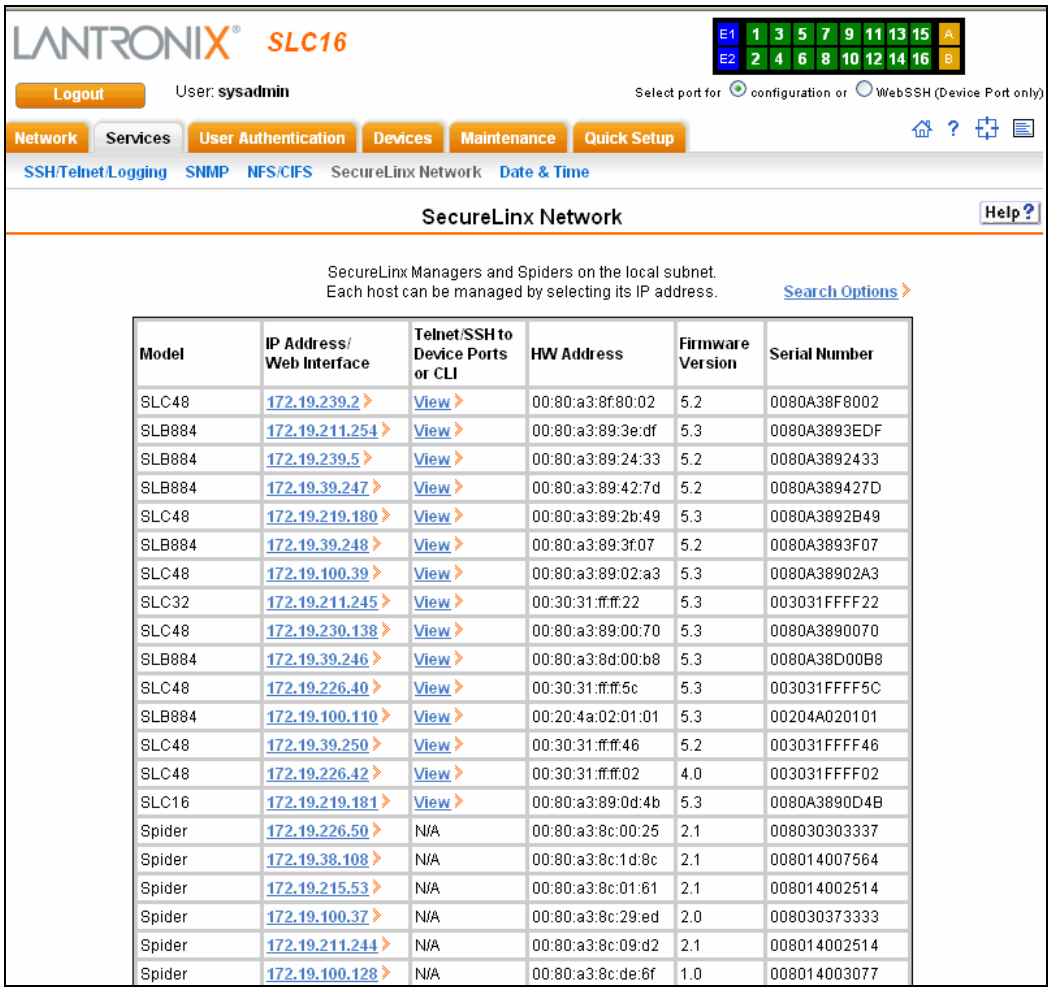
SecureLinx Network

Use the SecureLinx Network option to view and manage SecureLinx Managers and Spiders on the local subnet.

Note: *Status and statistics shown on the web interface represent a snapshot in time. To see the most recent data, reload the web page.*

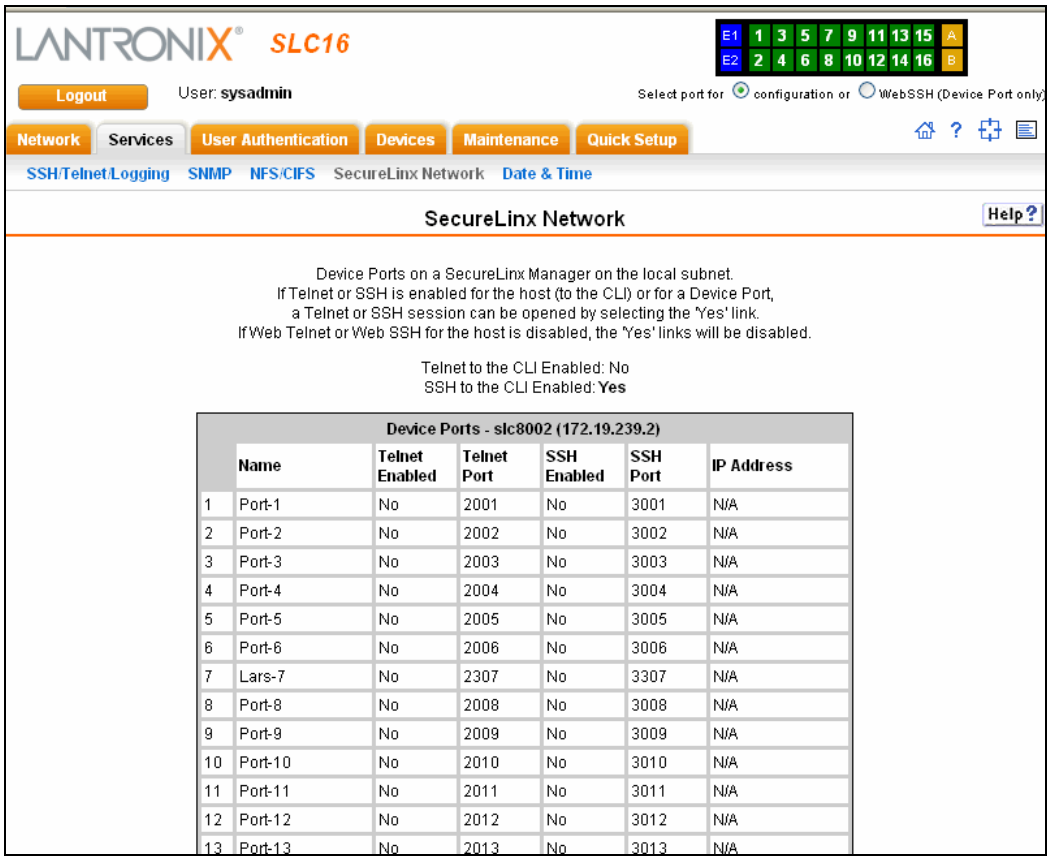
To view and manage SecureLinx Managers and Spiders on the local network:

1. Click the **Services** tab and select the **SecureLinx Network** option. The following page displays.



Model	IP Address/ Web Interface	Telnet/SSH to Device Ports or CLI	HW Address	Firmware Version	Serial Number
SLC48	172.19.239.2	View	00:80:a3:8f:80:02	5.2	0080A38F8002
SLB884	172.19.211.254	View	00:80:a3:89:3e:df	5.3	0080A3893EDF
SLB884	172.19.239.5	View	00:80:a3:89:24:33	5.2	0080A3892433
SLB884	172.19.39.247	View	00:80:a3:89:42:7d	5.2	0080A389427D
SLC48	172.19.219.180	View	00:80:a3:89:2b:49	5.3	0080A3892B49
SLB884	172.19.39.248	View	00:80:a3:89:3f:07	5.2	0080A3893F07
SLC48	172.19.100.39	View	00:80:a3:89:02:a3	5.3	0080A38902A3
SLC32	172.19.211.245	View	00:30:31:ff:ff:22	5.3	003031FFFF22
SLC48	172.19.230.138	View	00:80:a3:89:00:70	5.3	0080A3890070
SLB884	172.19.39.246	View	00:80:a3:8d:00:b8	5.3	0080A38D00B8
SLC48	172.19.226.40	View	00:30:31:ff:ff:5c	5.3	003031FFFF5C
SLB884	172.19.100.110	View	00:20:4a:02:01:01	5.3	00204A020101
SLC48	172.19.39.250	View	00:30:31:ff:ff:46	5.2	003031FFFF46
SLC48	172.19.226.42	View	00:30:31:ff:ff:02	4.0	003031FFFF02
SLC16	172.19.219.181	View	00:80:a3:89:0d:4b	5.3	0080A3890D4B
Spider	172.19.226.50	N/A	00:80:a3:8c:00:25	2.1	008030303337
Spider	172.19.38.108	N/A	00:80:a3:8c:1d:8c	2.1	008014007564
Spider	172.19.215.53	N/A	00:80:a3:8c:01:61	2.1	008014002514
Spider	172.19.100.37	N/A	00:80:a3:8c:29:ed	2.0	008030373333
Spider	172.19.211.244	N/A	00:80:a3:8c:09:d2	2.1	008014002514
Spider	172.19.100.128	N/A	00:80:a3:8c:de:6f	1.0	008014003077

2. To manage a SecureLinx device, click its **IP Address**. A separate browser page takes the user to the web interface for the selected SecureLinx device (login required).
3. For SecureLinx Managers, if SSH or Telnet is enabled for the device (to the CLI) or for a device port and you want to access the device or device port:
   a) Click the **View** link in the **Telnet/SSH to Device Ports or CLI** column. The following page displays:

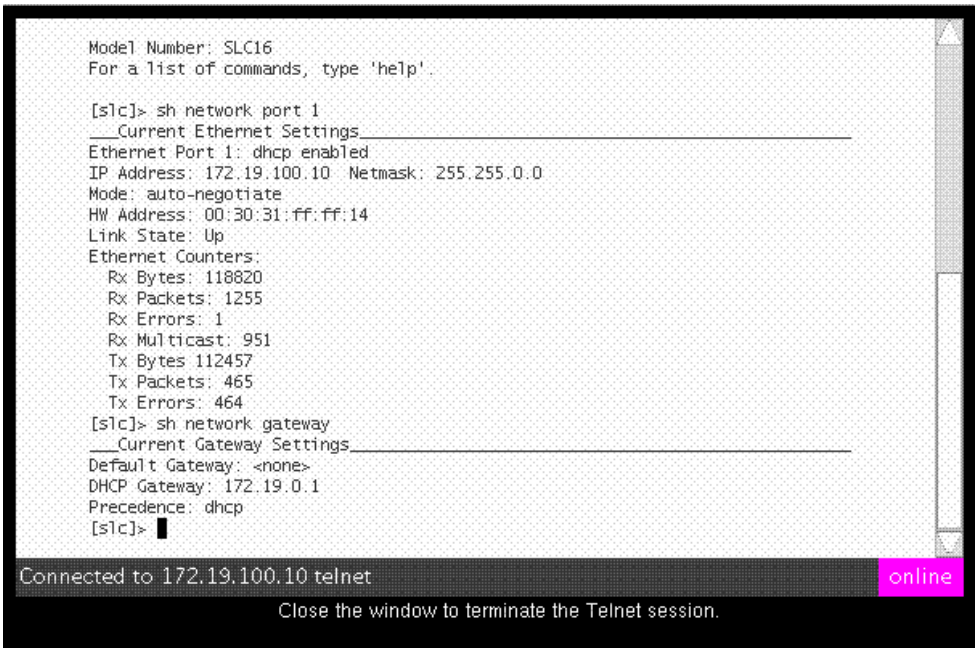


	Name	Telnet Enabled	Telnet Port	SSH Enabled	SSH Port	IP Address
1	Port-1	No	2001	No	3001	N/A
2	Port-2	No	2002	No	3002	N/A
3	Port-3	No	2003	No	3003	N/A
4	Port-4	No	2004	No	3004	N/A
5	Port-5	No	2005	No	3005	N/A
6	Port-6	No	2006	No	3006	N/A
7	Lars-7	No	2307	No	3307	N/A
8	Port-8	No	2008	No	3008	N/A
9	Port-9	No	2009	No	3009	N/A
10	Port-10	No	2010	No	3010	N/A
11	Port-11	No	2011	No	3011	N/A
12	Port-12	No	2012	No	3012	N/A
13	Port-13	No	2013	No	3013	N/A

Above the table, the **Telnet to the CLI Enabled** and **SSH to the CLI Enabled** fields indicate whether the unit has been set for Telnet or SSH access to the CLI. The table page lists all of the unit's device ports (if applicable), indicates whether they are Telnet enabled or SSH enabled, and lists their Telnet and SSH port numbers.

Note: *For the links to work, you must enable **Web Telnet** or **Web SSH** for the SecureLinx unit (see SSH/Telnet/Logging on page 54).*

b) To open a Telnet session to the CLI, click **Yes** in the **Telnet to the CLI Enabled** field above the table.



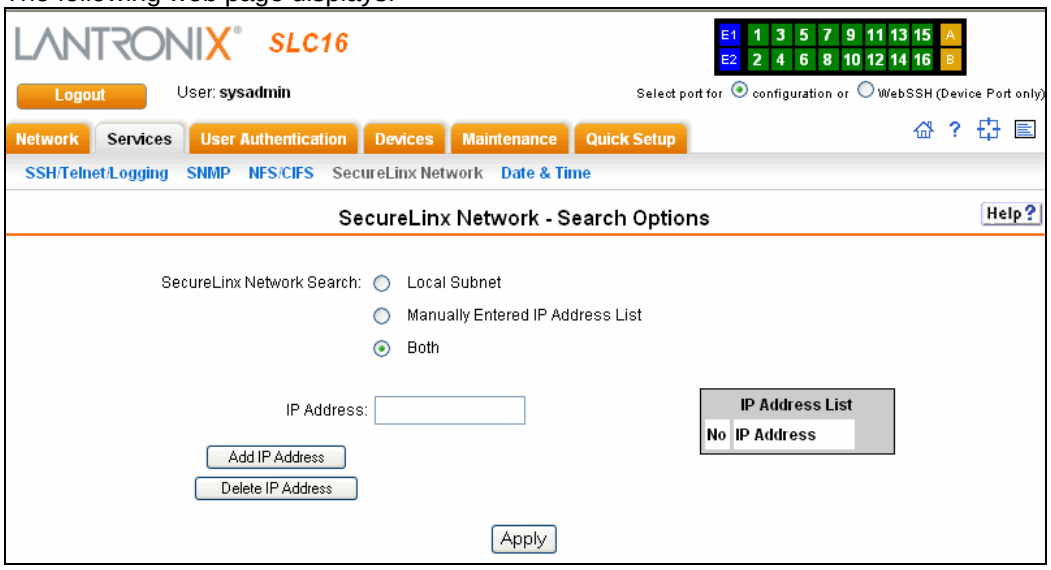
c) To open a Telnet session to a specific device port, click the **Yes** link in the **Telnet Enabled** column.

d) To open an SSH session to the CLI, click **Yes** in the **SSH to the CLI Enabled** field above the table.

e) To open an SSH session to a specific device port, click the **Yes** link in the **SSH Enabled** column.

To configure how SecureLinx devices are searched for on the network:

1. Click the **Search Options** link on the top right of the SecureLinx Network page. The following web page displays:



2. Enter the following:

SecureLinx Network Search	Select the type of search you want to conduct. **Local Subnet** performs a broadcast to detect SecureLinx devices on the local subnet. **Manually Entered IP Address List** provides a list of IP addresses that may not respond to a broadcast because of how the network is configured. The default is **Both**.
IP Address	If you selected **Manually Entered IP Address List** or **Both**, enter the IP address of the SecureLinx device you want to find and manage.

3. If you entered an IP address, click the **Add IP Address** button. The IP address displays in the IP Address List.
4. Repeat steps 2 and 3 for each IP address you want to add.
5. To delete an IP address from the IP Address List, select the address and click the **Delete IP Address** button.
6. Click the **Apply** button. When the confirmation message displays, click **SecureLinx Network** on the main menu. The SecureLinx Network page displays the SecureLinx devices resulting from the search. You can now manage these devices.

SecureLinx Network Commands

The following commands for the command line interface correspond to the web page entries described above.

To detect and view all SLC or user-defined IP addresses on the local network:

```
set slcnetwork <one or more parameters>
```

Parameters:

```
add <IP Address>
delete <IP Address>
search <localsubnet|ipaddrlist|both>
```

To detect and display all SecureLinx Managers and Spiders on the local network:

```
show slcnetwork [ipaddrlist <all|Address Mask>]
```

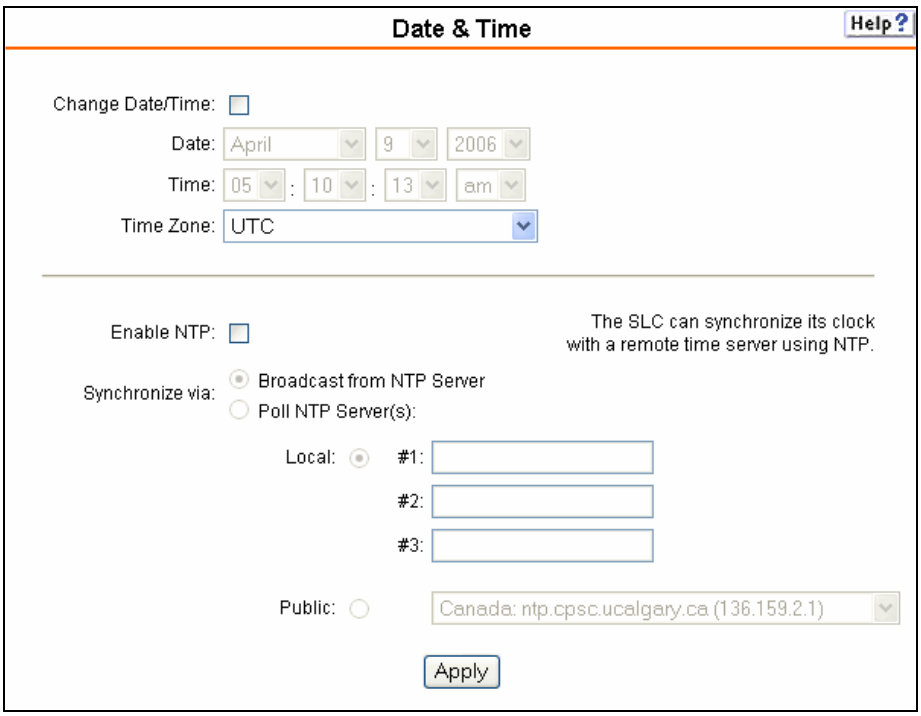
Note: *Without the* `ipaddrlist` *parameter, the command searches the network according to the search setting (see* `set slcnetwork`*, below). With the* `ipaddrlist` *parameter, the command displays a sorted list of all IP addresses or displays the IP addresses that match the mask (for example, 172.19.255.255 would display all IP addresses that start with 172.19).*

Date and Time

You can specify the current date, time, and time zone at the SLC's location (default), or the SLC can use NTP to synchronize with other NTP devices on your network.

To set the local date, time, and time zone:

1. From the main menu, select **Date & Time**. The following page displays:



2. Enter the following:

Change Date/Time	Select the checkbox to manually enter the date and time at the SLC's location.
Date	From the drop-down lists, select the current month, day, and year.
Time	From the drop-down lists, select the current hour and minute.
Time Zone	From the drop-down list, select the appropriate time zone.

3. To save, click the **Apply** button.

To synchronize the SLC with a remote timeserver using NTP:

1. Enter the following:

Enable NTP	Select the checkbox to enable NTP synchronization. NTP is disabled by default.

Synchronize via	Select one of the following: **Broadcast from NTP Server:** Enables the SLC to accept time information periodically transmitted by the NTP server. This is the default if you enable NTP. **Poll NTP Server:** Enables the SLC to query the NTP Server for the correct time. If you select this option, complete one of the following: ***Local:*** Select this option if the NTP servers are on a local network, and enter the IP address of up to three NTP servers. This is the default, and it is highly recommended. ***Public:*** Select this option if you want to use a public NTP server, and select the address of the NTP server from the drop-down list. This is not recommended because of the high load on many public NTP servers. All servers in the drop-down list are stratum-2 servers. (See www.ntp.org for more information.) Each public NTP server has its own usage rules - -please refer to the appropriate web site before using one. Our listing them here is to provide easy configuration but does not indicate any permission for use.

2. To save, click the **Apply** button.

Date and Time Commands

The following CLI commands correspond to the web page entries described above.

To set the local date, time, and local time zone (one parameter at a time):

```
set datetime <one date/time parameter>
```

Parameters:

```
date <MMDDYYhhmm[ss]>
timezone <Time Zone>
```

Note: *If you type an invalid time zone, the system guides you through the process of selecting a time zone.*

To view the local date, time, and time zone:

```
show datetime
```

To synchronize the SLC with a remote time server using NTP:

```
set ntp <one or more ntp parameters>
```

Parameters:

```
localserver1 <IP Address or Hostname>
localserver2 <IP Address or Hostname>
localserver3 <IP Address or Hostname>
poll <local|public>
publicserver <IP Address or Hostname>
state <enable|disable>
sync <broadcast|poll>
```

To view NTP settings:

```
show ntp
```

8: Devices

This chapter describes how to view the status of, configure, and use an SLC device port connected to an external device, such as a server or a modem. *Chapter 10: Connections* describes how to use the Connections web page to connect external devices and outbound network connections (such as Telnet or SSH) in various configurations. The Console Port page allows you to configure the console port, if desired.

Connection Methods

A user can connect to a device port in one of the following ways:

1. Telnet or SSH to the Eth1 or Eth2 IP address, or connect to the console port, and log in to the command line interface. At the command line interface, issue the `connect direct` or `connect listen` commands.
2. If Telnet is enabled for a device port, Telnet to <Eth1 IP address>:< telnet port number> or <Eth2 IP address>:<telnet port number>, where telnet port number is uniquely assigned for each device port.
3. If SSH is enabled for a device port, SSH to <Eth1 IP address>:<ssh port number> or <Eth2 IP address>:<ssh port number>, where ssh port number is uniquely assigned for each device port.
4. If TCP is enabled for a device port, establish a raw TCP connection to <Eth1 IP address>:<tcp port number> or <Eth2 IP address>:<tcp port number>, where tcp port number is uniquely assigned for each device port.
5. If a device port has an IP address assigned to it, you can Telnet, SSH, or establish a raw TCP connection to the IP address. For Telnet and SSH, use the default TCP port number (23 and 22, respectively) to connect to the device port. For raw TCP, use the TCP port number defined for **TCP In** to the device port on the *Device Ports – Settings* page.
6. Connect a terminal or a terminal emulation program directly to the device port. If logins are enabled, the user is prompted for a username and password and logs in to the command line interface.

For #2, #3, #4, #5, and #6, if logins or authentication are *not* enabled, the user is directly connected to the device port with no authentication.

For #1 and #6, if logins are enabled, the user is authenticated first, and then logged into the command line interface. The user login determines permissions for accessing device ports.

Permissions

There are three types of permissions:

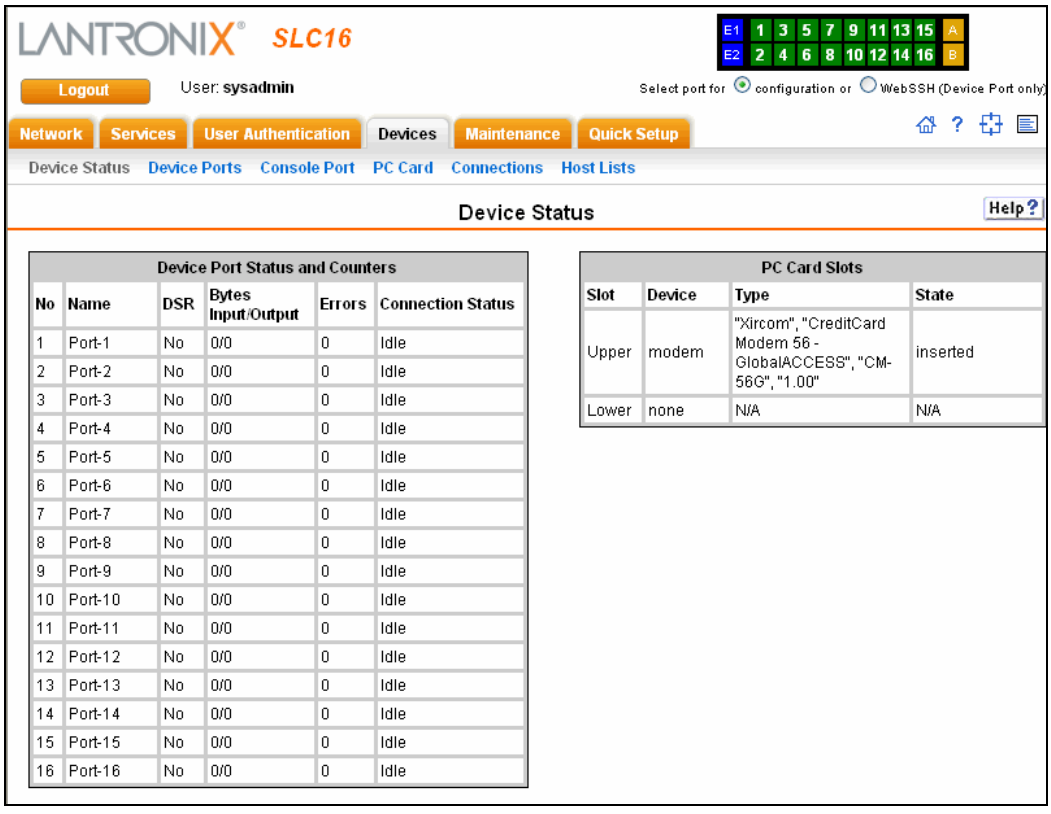
- **Direct (or data) mode:** The user can interact with and monitor the device port (`connect direct` command).
- **Listen mode:** The user can only monitor the device port (`connect listen` command).
- **Clear mode:** The user can clear the contents of the device port buffer (`set locallog <port> clear buffer` command).

The administrator and users with local user rights may assign individual port permissions to local users. The administrator and users with remote authentication rights assign port access to users authenticated by NIS, RADIUS, LDAP, Kerberos and TACACS+.

Device Status

The Device Status page displays the status of the SLC's ports and PC card slots.

1. Click the **Devices** tab and select the **Device Status** option. The following page displays:



Device Port Status and Counters

No	Name	DSR	Bytes Input/Output	Errors	Connection Status
1	Port-1	No	0/0	0	Idle
2	Port-2	No	0/0	0	Idle
3	Port-3	No	0/0	0	Idle
4	Port-4	No	0/0	0	Idle
5	Port-5	No	0/0	0	Idle
6	Port-6	No	0/0	0	Idle
7	Port-7	No	0/0	0	Idle
8	Port-8	No	0/0	0	Idle
9	Port-9	No	0/0	0	Idle
10	Port-10	No	0/0	0	Idle
11	Port-11	No	0/0	0	Idle
12	Port-12	No	0/0	0	Idle
13	Port-13	No	0/0	0	Idle
14	Port-14	No	0/0	0	Idle
15	Port-15	No	0/0	0	Idle
16	Port-16	No	0/0	0	Idle

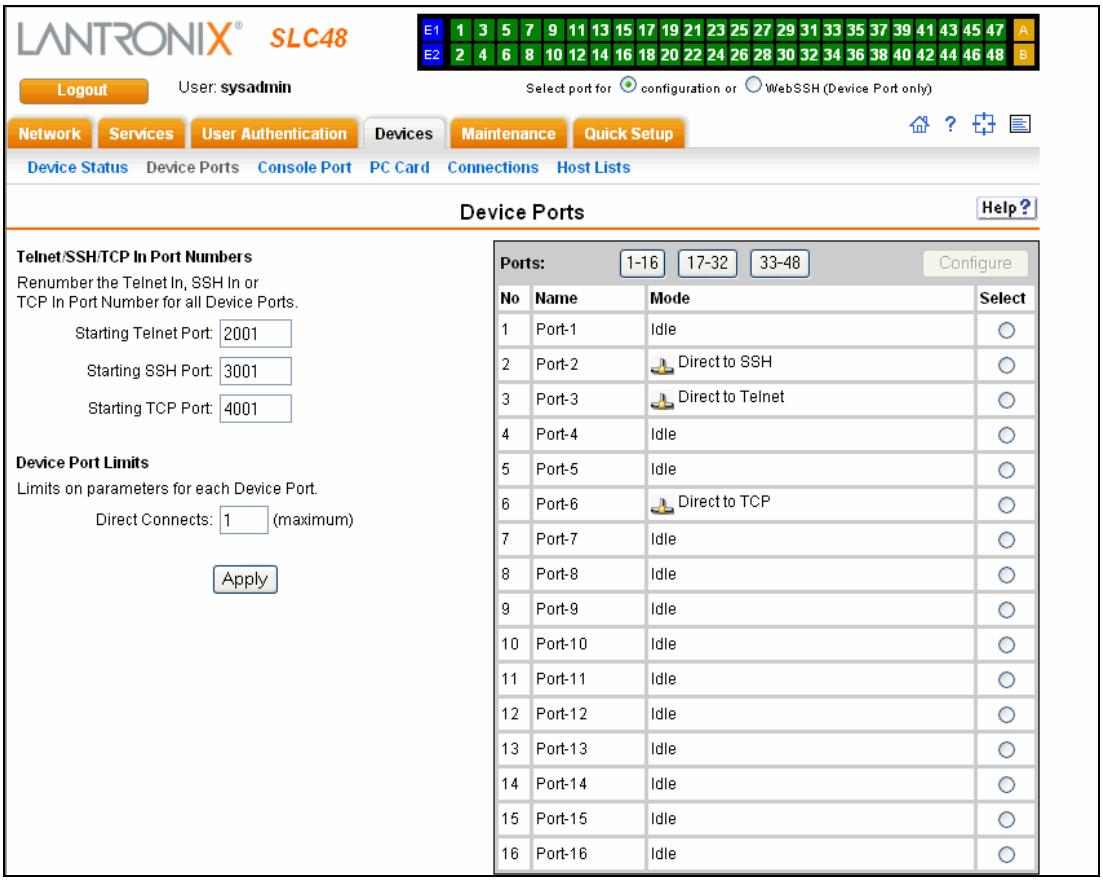
PC Card Slots

Slot	Device	Type	State
Upper	modem	"Xircom", "CreditCard Modem 56 - GlobalACCESS", "CM-56G", "1.00"	inserted
Lower	none	N/A	N/A

Global Port Settings

On the Device Ports page, you can set up the numbering of Telnet, SSH, and TCP ports, view a summary of current port modes, establish the maximum number of direct connections for each device port, and select individual ports to configure.

1. Click the **Devices** tab and select the **Device Status** option. The following page displays:



Current port numbering schemes for Telnet, SSH, and TCP ports display on the left. The list of ports 1-16 on the right includes the individual ports and their current mode.

Note: To view additional ports, click the **17-32** button or the **33-48** button, as appropriate.

Icons that represent some of the possible modes include:

Idle The port is not in use.

The port is in data/text mode.

Note: *You may set up ports to allow Telnet access using the IP Settings on the Device Ports – Settings page.*

An external modem is connected to the port. The user may dial into or out of the port.

Telnet in or SSH in is enabled for the device port. The device port is either waiting for a Telnet or SSH login or has received a Telnet or SSH login (a user has logged in).

To set up Telnet, SSH, and **TCP port numbering:**

1. Enter the following:

Telnet/SSH/TCP in Port Numbers

Starting Telnet Port	Each port is assigned a number for connecting via Telnet. Enter a number (1025-65535) that represents the first port. The default is 2000 plus the port number. For example, if you enter 2001, subsequent ports are automatically assigned numbers 2002, 2003, and so on.
Starting SSH Port	Each port is assigned a number for connecting via SSH. Enter a number (1025-65535) that represents the first port. The default is 3000 plus the port number. For example, if you enter 3001, subsequent ports are automatically assigned numbers 3002, 3003, and so on.
Starting TCP Port	Each port is assigned a number for connecting through a raw TCP connection. Enter a number (1025-65535) that represents the first port. The default is 4000 plus the port number. For example, if you enter 4001, subsequent ports are automatically numbered 4002, 4003, and so on. You can use a raw TCP connection in situations where a TCP/IP connection is to communicate with a serial device. For example, you can connect a serial printer to a device port and use a raw TCP connection to spool print jobs to the printer over the network. ***Note:*** *When using raw TCP connections to transmit binary data, or where the break command (escape sequence) is not required, set the* ***Break Sequence*** *of the respective device port to null (clear it).*

Caution: ***Ports 1-1024 are RFC-assigned and may conflict with services running on the SLC. Avoid this range.***

2. Click the **Apply** button to save the settings.

To set limits on direct connections:

1. Enter the maximum number (1-10) of simultaneous direct connections for each device port. The default is **1**.
2. Click the **Apply** button to save the settings.

To configure a specific port:

1. You have two options:
   - Select the port from the ports list and click the **Configure** button. The Device Ports – Settings page for the port displays.
   - Click the port number on the green bar at the top of each page.
2. Continue with *Device Ports – Settings* on page 76.

Global Commands

The following CLI commands correspond to the web page entries described above.

To configure settings for all or a group of device ports:

```
set deviceport global <one or more parameters>
```

Parameters:

```
maxdirect <1-10>
```
Sets the maximum number of direct connections for each device port.

```
sshport <TCP Port>
```

```
tcpport <TCP Port>
```

```
telnetport <TCP Port>
```
Port is a port number between 1025 and 65535.

To view global settings for device ports:

```
show deviceport global
```

Device Ports – Settings

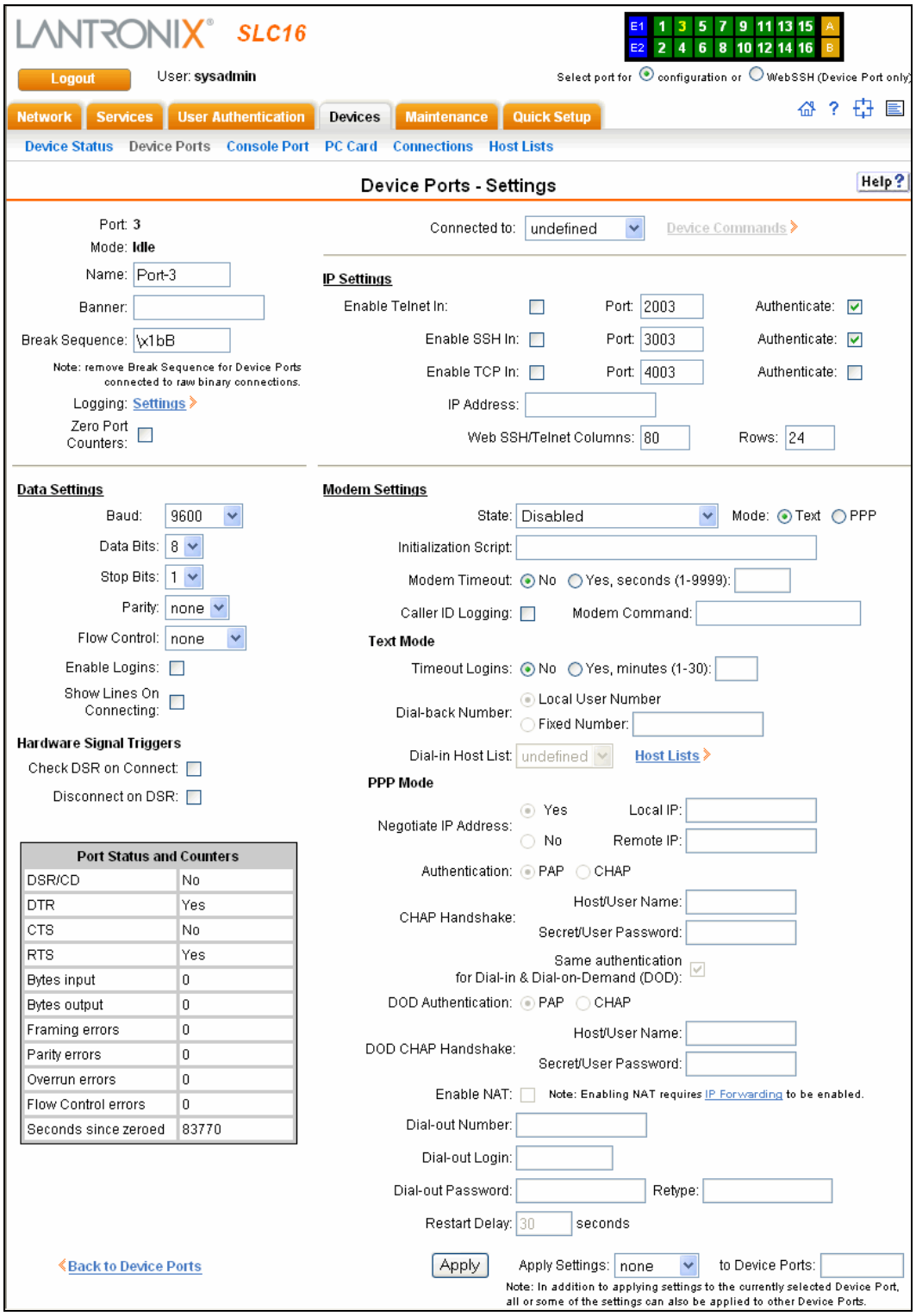
On the Device Ports - Settings page, configure IP and data (serial) settings for individual ports, and if the port connects to an external modem, modem settings as well.

To open the Device Ports – Settings page:

You have two options:

- In the Device Ports page (described in the previous section), select the port from the ports list and click the **Configure** button.
- Click the desired port number in the green bar (shown below) at the top of any page:

The following page displays:



To enter device port settings:

1. Enter the following:

Mode	The status of the port; displays automatically.

Name	The name of the port. Valid characters are letters, numbers, dashes (-), periods, and underscores (_).
Banner	Text to display when a user connects to a device port by means of Telnet, SSH, or TCP. If authentication is enabled for the device port, the banner displays once the user successfully logs in. Blank is the default.
Break Sequence	A series of one to ten characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase "B" performed quickly but not simultaneously). You would specify this value as **\x1bB**, which is hexadecimal **(\x)** character 27 (**1B**) followed by a **B**.
Logging	Click the **Settings** link to configure file logging, email logging, local logging, and PC Card logging. (See *Device Ports – Logging* on page 89.)
Zero Port Counters	Resets all of the numerical values in the Port Counters table at the bottom of the page to zero (0).
Connected to	The type of device connected to the device port. Presently, the SLC supports Lantronix's SecureLinx Remote Power Manager (SLP8 and SLP16) and Sensorsoft devices. If the type of device is not listed, select **undefined**. If you select anything other than **undefined**, click **Device Commands**. The appropriate web page displays.

IP Settings

Enable Telnet In	Enables access to this port through Telnet. Disabled by default.
Enable SSH In	Enables access to this port through SSH. Disabled by default.
Enable TCP in	Enables access to this port through a raw TCP connection. Disabled by default. ***Note:*** *When using raw TCP connections to transmit binary data, or where the break command (escape sequence) is not required, set the* ***Break Sequence*** *of the respective device port to null (clear it).*
Port	Automatically assigned Telnet, SSH, and TCP port numbers. (See *8: Devices* for information on setting up the numbering scheme.) You may override this value, if desired.
Authenticate	If selected, the SLC requires user authentication before granting access to the port. **Authenticate** is selected by default for **Telnet in** and **SSH in,** but not for **TCP in**.

IP Address	IP address used for this device port so a user can Telnet, SSH, or establish a raw TCP connection to this address and connect directly to the device port. For Telnet and SSH, the default TCP port numbers (22 and 23, respectively) are used to connect to the device port. For raw TCP, the TCP port number defined for **TCP In** to the device port is used.
Web SSH/Telnet Columns	Number of columns in the Web SSH/Telnet applet when this device port is accessed via the applet.
Web SSH/Telnet Rows	Number of rows in the Web SSH/Telnet applet when this device port is accessed via the applet.

Data Settings

Note: *Check the serial device's equipment settings and documentation for the proper settings. The device port and the attached serial device must have the same settings.*

Baud	The speed with which the device port exchanges data with the attached serial device. From the drop-down list, select the baud rate. Most devices use 9600 for the administration port, so the device port defaults to this value. Check the equipment settings and documentation for the proper baud rate.
Data Bits	Number of data bits used to transmit a character. From the drop-down list, select the number of data bits. The default is **8** data bits.
Stop Bits	The number of stop bit(s) used to indicate that a byte of data has been transmitted. From the drop-down list, select the number of stop bits. The default is **1**.
Parity	Parity checking is a rudimentary method of detecting simple, single-bit errors. From the drop-down list, select the parity. The default is **none**.
Flow Control	A method of preventing buffer overflow and loss of data. The available methods include none, xon/xoff (software), and RTS/CTS (hardware). The default is **none**.
Enable Logins	For serial devices connected to the device port, displays a login prompt and authenticates users. Successfully authenticated users are logged into the command line interface. Disabled is the default and is the correct setting if the device port is the endpoint for a connection.

Show Lines on Connecting	If enabled, when the user either does a `connect direct` from the CLI or connects directly to the port using Telnet or SSH, the SLC outputs up to 24 lines of buffered data as soon as the serial port is connected. For example, an SLC issues a `connect direct device 1` command to connect port 1 to a Linux server. Then the SLC user gets a directory with the `ls` command exits the connection. When the SLC user issues another `direct connect device 1`", the output of the `ls` command (or some portion of it) is output again, so the user can know what state the server was left in.

Hardware Signal Triggers

Check DSR on Connect	If this setting is enabled, the device port only establishes a connection if DSR (Data Set Ready) is in an asserted state. DSR should already be in an asserted state, not transitioning to, when a connection attempt is made. Disabled by default unless dial-in, dial-out, or dial-back is enabled for the device port.
Disconnect on DSR	If a connection to a device port is currently in session, and the DSR signal transitions to a de-asserted state, the connection disconnects immediately. Disabled is the default unless dial-in, dial-out, or dial-back is enabled for the device port.

Modem Settings

Note: *Depending on the **State** and **Mode** you select, different fields are available.*

State	Indicates whether an external modem is attached to the device port. If enabling, set the modem to dial-out, dial-in, dial-back, dial-on-demand, dial-in/host list, or dial in & dial-on-demand. Disabled by default.
Mode	The format in which the data flows back and forth: **Text:** In this mode, the SLC assumes that the modem will be used for remotely logging into the command line. Text mode can only be used for dialing in or dialing back. **Text** is the default. **PPP:** This mode establishes an IP-based link over the modem. PPP connections can be used in dial-out mode (e.g., the SLC connects to an external network), dial-in mode (e.g., the external computer connects to the network that the SLC is part of), or dial-on-demand.
Initialization Script	Commands sent to configure the modem may have up to 100 characters. Consult your modem's documentation for recommended initialization options. If you do not specify an initialization script, the SLC uses a default initialization string of **AT S7=45 SO=0 L1 V1 X4 &D2 &c1 E1 Q0**. ***Note:*** *We recommend that the modem initialization script always be preceded with **AT** and include **E1 V1 x4 Q0** so that the SLC may properly control the modem.*

Modem Timeout	Timeout for all modem connections. Select Yes (default) for the SLC to terminate the connection if no traffic is received during the configured idle time. Enter a value of from 1 to 9999 seconds. The default is 30 seconds.
Caller ID Logging	Select to enable the SLC to log caller IDs on incoming calls. Disabled by default. ***Note:*** *For the Caller ID* ***AT*** *command, refer to the modem user guide*.
Modem Command	Modem **AT** command used to initiate caller ID logging by the modem. ***Note:*** *For the* ***AT*** *command, refer to the modem user guide*.

Modem Settings: Text Mode

Timeout Logins	If you selected **Text** mode, you can enable logins to time out after the connection is inactive for a specified number of minutes. The default is **No**. This setting is only applicable for text mode connections. **PPP** mode connections stay connected until either side drops the connection. Disabled by default.
Dial Back Number	Users with dial-back access can dial into the SLC and enter their login and password. Once the SLC authenticates them, the modem hangs up and dials them back. Select the phone number the modem dials back on a fixed number or a number associated with their login. If you select Fixed **Number**, enter the number (in the format 2123456789).
Dial-in Host List	From the drop-down list, select the desired host list. The host list is a prioritized list of SSH, Telnet, and TCP hosts that are available for establishing outgoing modem connections or for **connect direct** at the CLI. The hosts in the list are cycled through until the SLC successfully connects to one. To establish and configure host lists, click the **Host Lists** link.

Modem Settings: PPP Mode

Negotiate IP Address	If the SLC and/or the serial device have dynamic IP addresses (e.g., IP addresses assigned by a DHCP server), select **Yes**. **Yes** is the default. If the SLC or the modem have fixed IP addresses, select **No,** and enter the local IP (IP address of the port) and remote IP (IP address of the modem).

Authentication	Enables **PAP** or **CHAP** authentication for modem logins. **PAP** is the default. With PAP, users are authenticated by means of the Local Users and any of the remote authentication methods that are enabled. With CHAP, the CHAP Handshake fields authenticate the user.
CHAP Handshake	The host/username (for UNIX systems) or secret/user password (for Windows systems) used for CHAP authentication. May have up to 128 characters.
Same authentication for Dial-in & Dial-on-Demand (DOD)	Select this option to let incoming connections (dial-in) use the same authentication settings as outgoing connections (dial-on-demand). If this option is not selected, then the dial-on-demand connections take their authentication settings from the DOD parameter settings. If DOD Authentication is PAP, then the DOD CHAP Handshake field is not used.
DOD Authentication	Enables **PAP** or **CHAP** authentication for dial-in & dial-on-demand. **PAP** is the default. With PAP, users are authenticated by means of the Local Users and any of the remote authentication methods that are enabled. With CHAP, the DOD CHAP Handshake fields authenticate the user.
DOD CHAP Handshake	For **DOD Authentication**, enter the host/username for UNIX systems) or secret/user password (for Windows systems) used for CHAP authentication. May have up to 128 characters.
Enable NAT	Select to enable Network Address Translation (NAT) for dial-in and dial-out PPP connections on a per modem (device port or PC Card) basis. Users dialing into the SLC access the network connected to Eth1 and/or Eth2. ***Note:*** *IP forwarding must be enabled on the Network - Settings page for NAT to work. See 6: Basic Parameters.*
Dial-out Number	Phone number for dialing out to a remote system or serial device. May have up to 20 characters. Any format is acceptable.
Dial-out Login	User ID for dialing out to a remote system. May have up to 32 characters.
Dial-out Password and **Retype**	Password for dialing out to a remote system. May have up to 64 characters.
Restart Delay	The number of seconds after the timeout and before the SLC attempts another connection. The default is **30** seconds.

2. To save settings for just this port, click the **Apply** button.
3. To save selected settings to ports other than the one you are configuring:
   a) From the **Apply Settings** drop-down box, select **none**, a group of settings, or **All**.

b) In **to Device Ports,** type the device port numbers, separated by commas; indicate a range of port numbers with a hyphen (e.g., 2, 5, 7-10).

Note: *It may take a few minutes for the system to apply the settings to multiple ports.*

Port Status and Counters

Port Counters describe the status of signals and interfaces. SLC updates and increments the port counters as signals change and data flows in and out of the system. These counters help troubleshoot connections or diagnose problems because they give the user an overview of the state of various parameters. By setting them to zero and then re-checking them later, the user can view changes in status.

The chart in the middle of the page displays the flow control lines and port statistics for the device port. The system automatically updates these values. To reset them to zeros, select the **Zero port counters** checkbox in the IP Settings section of the page.

Note: *Status and statistics shown on the web interface represent a snapshot in time. To see the most recent data, you must reload the web page.*

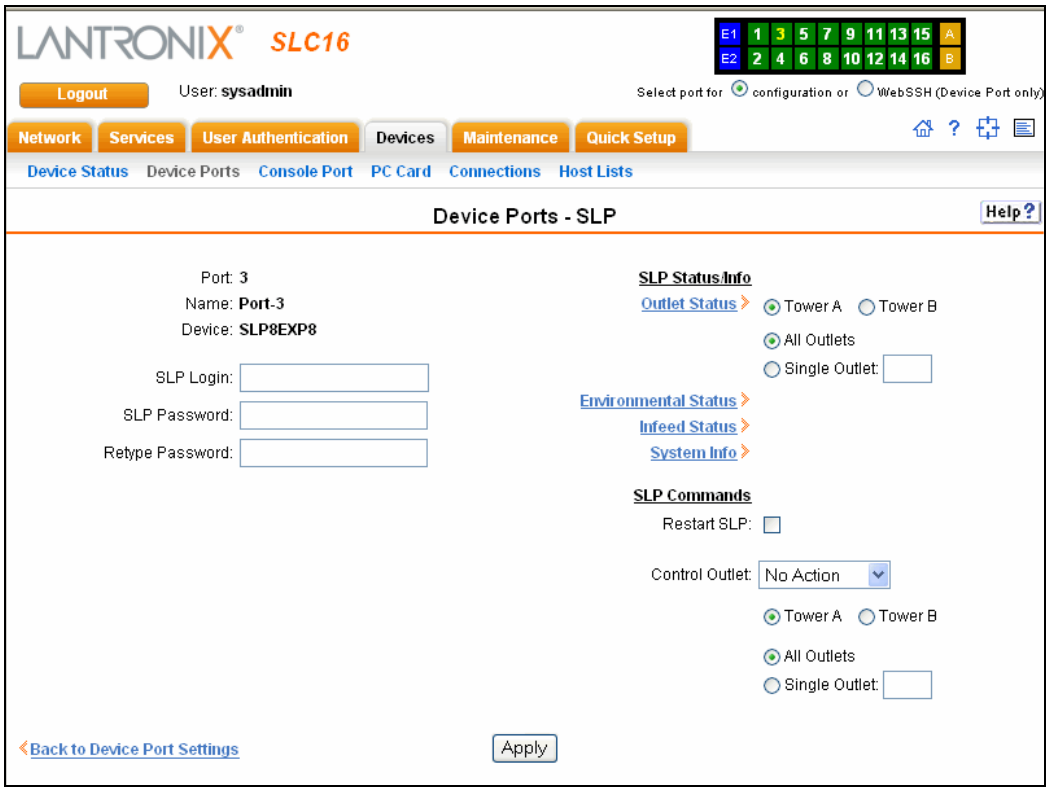
Port Status and Counters	
DSR/CD	No
DTR	Yes
CTS	No
RTS	Yes
Bytes input	0
Bytes output	0
Framing errors	0
Parity errors	0
Overrun errors	0
Flow Control errors	0
Seconds since zeroed	84127

Device Ports – SLP

On the Device Ports – SLP page, configure commands to send to an SLP or SLP expansion chassis that expands the number of power ports.

To open the Device Ports – SLP page:

1. In the **Connected to** field above the IP Settings section of the Device Ports – Settings page, select an SLP or SLPEXP.
2. Click the **Device Commands** link. The following page displays:



To enter SLP commands:

1. Enter the following:

SLP Login	User ID for logging into the SLP.
SLP Password/Retype Password	Password for logging into the SLP.

SLP Status/Info

Outlet Status	***Note:*** *If there is an SLP and an SLP Expansion chassis, the SLP is Tower A and the Expansion chassis is Tower B.* For Tower A or Tower B, select **All Outlets** or **Single Outlet** to view the status of all outlets or a single outlet of the SLP. If you select **Single Outlet**, enter a value of 1-8 for the SLP8 or 1-16 for the SLP16. Click the **Outlet Status** link to see the status of the selected outlet(s).
Environmental Status	Click the link to view the environmental status (e.g., temperature and humidity) of the SLP.
Infeed Status	Click the link to view the status of the data the SLP is receiving.
System Info	Click the link to see system information pertaining to the SLP.

SLP Commands

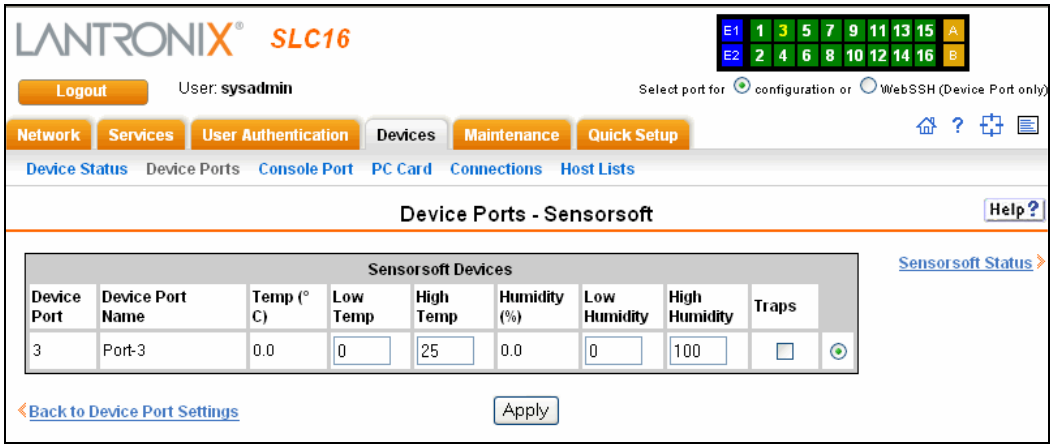
Restart SLP	To restart the SLP, select the checkbox.
Control Outlet	For Tower A or Tower B, select **All Outlets** or **Single Outlet** and the number of the outlet to be controlled (1-8 for the SLP8 or 1-16 for the SLP16) and select the command for the outlet (No Action, Power On, Power Off, Cycle Power). **No Action** is the default.

2. Click the **Apply** button.

Device Port – Sensorsoft Device

Devices made by Sensorsoft are used to monitor environmental conditions.

1. In the **Connected to** field above the IP Settings section of the Device Ports – Settings page, select **Sensorsoft.**
2. Click the **Device Commands** link. The following page displays:



3. Select a port and enter or view the following information:

Device Port (view only)	Number of the SLC port.
Device Name (view only)	Name of the SLC port.
Temp (°C)	Current temperature (degrees Celsius) on the device the sensor is monitoring.
Low Temp	Enter the temperature (degrees Celsius) permitted on the monitored device below which the SLC sends a trap.
High Temp	Enter the temperature (degrees Celsius) permitted on the monitored device above which the SLC sends a trap.
Humidity (%)	Current relative humidity on the device the sensor is monitoring.
Low Humidity	Enter the relative humidity permitted on the device the sensor is monitoring below which the sensor sends a trap to the SLC.

High Humidity	Enter the highest relative acceptable humidity permitted on the device above which the sensor sends a trap to the SLC.
Traps	Select to indicate the SLC should send a trap or configured Event Alert when the sensor detects an out-of-range configured threshold. (See *Events* on page 192.)

4. Click the **Apply** button.
5. To view the status detected by the Sensorsoft, click the **Sensorsoft Status** link to the right of the table.

Device Port Commands

The following CLI commands correspond to the web page entries described above.

To configure a single port or a group of ports:

Example: *set deviceport port 2-5,6,12,15-16 baud 2400*

```
set deviceport port <Device Port List or Name> <one or more
device port parameters>
```

Parameters:

```
auth <pap|chap>
banner <Banner Text>
baud <300-115200>
breakseq <1-10 Chars>
calleridcmd <Modem Command String>
calleridlogging <enable|disable>
chaphost <CHAP Host or User Name>
chapsecret <CHAP Secret or User Password>
```

The user defines the secret.

```
checkdsr <enable|disable>
closedsr <enable|disable>
databits <7|8>
device <none|slp8|slp16>
dialinlist <Host List for Dial-in>
dialoutnumber <Phone Number>
dialoutlogin <User Login>
dialoutpassword <Password>
dialbacknumber <usernumber|Phone Number>
dodauth <pap|chap>
dodchaphost <CHAP Host or User Name>
dodchapsecret <CHAP Secret or User Password>
flowcontrol <none|xon/xoff|rts/cts>
idletimeout <disable|1-9999 seconds>
ipaddr <IP Address>
initscript <Initialization Script>
```

A script that initializes a modem.

```
localipaddr <negotiate|IP Address>
logins <enable|disable>
modemmode <text|ppp>
modemstate
<disable|dialout|dialin|dialback|dialondemand|dial
in+dialondemand|dialinhostlist>
modemtimeout <disable|1-9999 seconds>
name <Device Port Name>
nat <enable|disable>
parity <none|odd|even>
remoteipaddr <negotiate|IP Address>
restartdelay <PPP Restart Delay>
showlines <enable|disable>
sshauth <enable|disable>
sshin <enable|disable>
sshport <TCP Port>
stopbits <1|2>
tcpauth <enable|disable>
tcpin <enable|disable>
tcpport <TCP Port>
telnetauth <enable|disable>
telnetin <enable|disable>
telnetport <TCP Port>
timeoutlogins <disable or 1-30>
webcolumns <Web SSH/Telnet Cols>
webrows <Web SSH/Telnet Rows>
```

To view the settings for one or more device ports:

```
show deviceport port <Device Port List or Name>
```

To view a list of all device port names:

```
show deviceport names
```

To view the `modes` and states of one or more device port(s):
You can optionally email the displayed information.

```
show portstatus [deviceport <Device Port List or Name>] [email
<Email Address>]
```

To view device port statistics and errors for one or more ports:
You can optionally email the displayed information.

```
show portcounters [deviceport <Device Port List or Name>]
[email <Email Address>]
```

To zero the port counters for one or more device ports:

```
show portcounters zerocounters <Device Port List or Name>
```

Device Commands

The following CLI commands correspond to the web page entries described above.

To send commands to (or control) a device connected to an SLC device port over the serial port:

Note: *Currently the only devices supported for this type of interaction are the SLP and Sensorsoft devices.*

```
set command <Device Port # or Name or List> <one or more parameters>
```

Parameters:

`slp auth login <User Login>`
Establishes the authentication information to log into the SLP attached to the device port.

`slp restart`
Issues the CLI command the SLP uses to restart itself.

`slp outletcontrol state <on|off|cyclepower> [outlet <Outlet #>][tower <A|B>]`

Outlet # is 1-8 for SLP8 and 1-16 for SLP16.
The `outletcontrol` parameters control individual outlets.

`slp outletstate [outlet <Outlet #>]`
The `outletstate` parameter shows the state of all outlets or a single outlet.

`slp envmon`
Displays the environmental status (e.g., temperature and humidity) of the SLP.

slp infeedstatus
Displays the infeed status and load of the SLP.

`slp system`
Provides system information for the SLP.

`sensorsoft lowtemp <Low Temperature in C.>`
Sets the lowest temperature permitted for the port.

`sensorsoft hightemp <High Temperature in C.>`
Sets the hightest temperature permitted for the port.

`sensorsoft lowhumidity <Low Humidity %>`
Sets the lowest humidity pemitted for the port.

`sensorsoft highhumidity <High Humidity %>`
Sets the lowest humidity permitted for the port.

`sensorsoft traps <enable|disable>`
Enables or disables traps when specified conditions are met.

`sensorsoft status`
Displays the status of the port.

Interacting with a Device Port

Once a device port has been configured and connected to an external device such as the console port of an external server, the data received over the device port can be monitored at the command line interface with the `connect listen` command, as follows:

To connect to a device port to monitor it:

```
connect listen deviceport <Port # or Name>
```

In addition, you can send data out the device port (for example, commands issued to an external server) with the `connect direct` command, as follows:

To connect to a device port to monitor and/or interact with it, or to establish an outbound network connection:

```
connect direct <endpoint>
```

endpoint is one of:

```
deviceport <Port # or Name>
ssh <IP Address> [port <TCP Port>][<SSH flags>]
```

where:

```
<SSH flags> is one or more of:
user <Login Name>
version <1|2>
command <Command to Execute>
tcp <IP Address> port <TCP Port>
telnet <IP Address> [port <TCP Port>]
udp <IP Address> port <UDP Port>
hostlist <Host List>
```

Notes:

- *To escape from the `connect direct` command when the endpoint of the command is `deviceport`, `tcp`, or `udp` and return to the command line interface, type the escape sequence assigned to the currently logged in user. If the endpoint is `telnet` or SSH, logging out returns the user to the command line prompt.*
- To escape from the `connect listen` command, press any key.
- *Setting up a user with an escape sequence is optional. For any NIS, LDAP, RADIUS, Kerberos, or TACACS+ user, or any local user who does not have an escape sequence defined, the default escape sequence is **Esc+A**.*

Device Ports – Logging

The SLC products support port buffering of the data on the system's device ports as well as notification of receiving data on a device port. Port logging is disabled by default. You can enable more than one type of logging (local, NFS file, email/SNMP, or PC Card) at a time. The buffer containing device port data is cleared when any type of logging is enabled.

Local Logging

If local logging is enabled, each device port stores 256 Kbytes (approximately 400 screens) of I/O data in a true FIFO buffer. You may view this data (in ASCII format) at the CLI with the `show locallog` command or on the Device Ports – Logging web page. Buffered data is normally stored in RAM and is lost in the event of a power failure if it is not logged using an NFS mount solution. If the buffer data overflows the buffer capacity, only the oldest data is lost, and only in the amount of overrun (not in large blocks of memory).

NFS File Logging

Data can be logged to a file on a remote NFS server. Data logged locally to the SLC is limited to 256 Kbytes and may be lost in the event of a power loss. Data logged to a file on an NFS server does not have these limitations. The system administrator can define the directory for saving logged data on a port-by-port basis and configure file size and number of files per port.

The directory path must be the local directory for one of the NFS mounts. For each logging file, once the file size reaches the maximum, a new file opens for logging. Once the number of files reaches the maximum, the oldest file is overwritten. The file naming convention is: <Device Port Number>_<Device Port Name>_<File number>.log.

Examples: 02_Port-2_1.log
02_Port-2_2.log
02_Port-2_3.log
02_Port-2_4.log
02_Port-2_5.log

PC Card Logging

Data can be logged to a PC Card Compact Flash that is loaded into one of the PC Card slots on the front of the SLC and properly mounted (see *PC Card Logging* on page 90). Data logged locally to the SLC is limited to 256 Kbytes and may be lost in the event of a power loss. Data logged to a PC Card Compact Flash does not have these limitations. The system administrator can define the file size and number of files per port. For each logging file, once the file size reaches the maximum, a new file opens for logging. Once the number of files reaches the maximum, the oldest file is overwritten. The file naming convention is: <Device Port Number>_<Device Port Name>_<File number>.log.

Examples: 02_Port-2_1.log
02_Port-2_2.log
02_Port-2_3.log
02_Port-2_4.log
02_Port-2_5.log

Email/SNMP Notification

The system administrator can configure the SLC to send an email alert message indicating a particular condition detected in the device port log to the appropriate parties or an SNMP trap to the designated NMS (see *7: Services*). The email or trap is triggered when a user-defined number of characters in the log from your server or device is exceeded, or a specific sequence of characters is received.

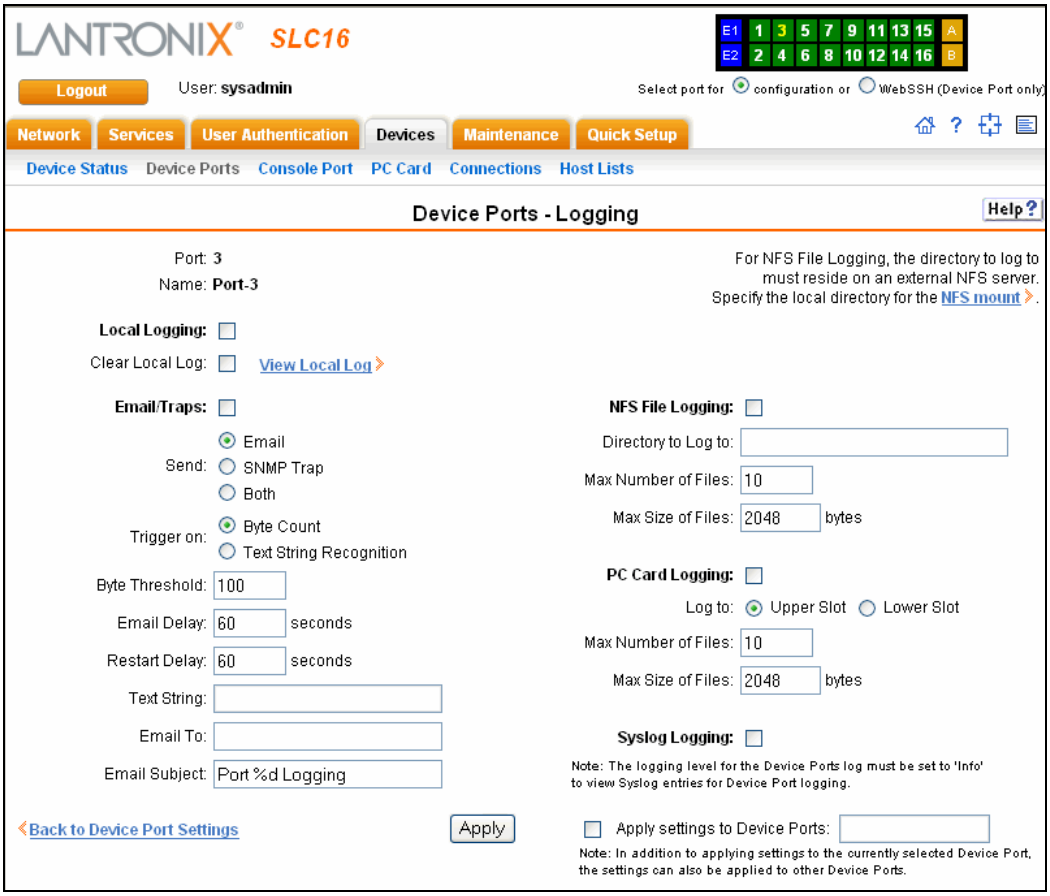
Use the Device Ports – Logging page to set logging parameters on individual ports.

Sylog Logging

Data can be logged to the system log. If this feature is enabled, the data will appear in the Device Ports log, under the Info level. The log level for the Device Ports log must be set to Info for the data to be saved to the system log. (See 7: Services.)

To set logging parameters:

1. In the top section of the Device Ports – Settings page, click the **Settings** link in the **Logging** field. The following page displays:



2. Enter the following:

Local Logging

Local Logging	If you enable local logging, each device port stores 256 Kbytes (approximately 400 screens) of I/O data in a true FIFO buffer. Disabled by default.

Clear Local Log	Select the checkbox to clear the local log.
View Local Log	Click this link to see the local log in text format.

Email/SNMP Traps

Email/Traps	Select the checkbox to enable email and SNMP logging. Email logging sends an email message to pre-defined email addresses or an SNMP trap to the designated NMS (see *7: Services*) when alert criteria are met. Disabled by default.
Send	If you enabled email and SNMP logging, select what type of notification log to send: **Email**, **SNMP**, or **Both**. **Email** is the default.
Trigger on	Select the method of triggering a notification: **Byte Count**: A specific number of bytes of data. This is the default. **Text String Recognition**: A specific pattern of characters, which you can define by a regular expression. ***Note:*** *Text string recognition may negatively impact the SLC's performance, particularly when regular expressions are used.*
Byte Threshold	The number of bytes of data the port receives before the SLC captures log data and sends a notification regarding this port. The default is **100** bytes. In most cases, the console port of your device does not send any data unless there is an alarm condition. After the SLC receives a small number of bytes, it perceives that your device needs some attention. The SLC notifies your technician when that point has been passed, and the notification includes the logged data. For example, a threshold preset at 30 characters means that as soon as the SLC receives 30 bytes of data, it captures log data and sends an email regarding this port.
Email Delay	A time limit of how long (in seconds), after the SLC detects the trigger, that the device port captures data before closing the log file (with a fixed internal buffer maximum capacity of 1500 bytes) and sending a notification. The default is **60** seconds.
Restart Delay	The number of seconds for the period *after* the notification has been sent during which the device port ignores additional characters received. The data is simply ignored and does not trigger additional alarms until this time elapses. The default is **60** seconds.

Text String	The specific pattern of characters the SLC must recognize before sending a notification to the technician about this port. The maximum is 100 characters. You may use a regular expression to define the pattern. For example, the regular expression “abc[def]g” recognizes the strings abcdg, abceg, abcfg. The SLC supports GNU regular expressions; for more information, see: http://www.codeforge.com/help/GNURegularExpr.html http://www.delorie.com/gnu/docs/regex/regex.html
Email to	The complete email address of the message recipient(s) for each device port(s). Each device port has its own recipient list. To enter more than one email address, separate the addresses with a **single space**. You can enter up to 128 characters.
Email Subject	A subject text appropriate for your site. May have up to 128 characters. The email subject line is pre-defined for each port with its port number. You can use the email subject to inform the desired recipients of the problem on a certain server or location (e.g., server location or other classification of your equipment). This is helpful if the email message goes to the system administrator’s or service technician's mobile or wireless device (e.g., text messaging by means of email). ***Note:*** The character sequence **%d** anywhere in the email subject is replaced with the device port number automatically.

NFS File Logging

NFS File Logging	Select the checkbox to log all data sent to the device port to one or more files on an external NFS server. Disabled by default.
Directory to Log to	The path of the directory where the log files will be stored. ***Note:*** *This directory must be a directory exported from an NFS server mounted on the SLC. Specify the local directory path for the NFS mount.*
Max Number of Files	The maximum number of files to create to contain log data to the port. These files keep a history of the data received from the port. Once this limit is exceeded, the oldest file is overwritten. The default is **10**.
Max Size of Files	The maximum allowable file size in bytes. The default is **2048** bytes. Once the maximum size of a file is reached, the SLC begins generating a new file.

PC Card Logging

PC Card Logging	Select to enable PC Card logging. A PC Card Compact Flash must be loaded into one of the PC Card slots on the front of the SLC and properly mounted ((see *PC Card Logging* on page 90). Disabled by default.
Log To	If port logging is to a PC Card, select the slot (**Upper** or **Lower**) in which the PC Card has been inserted. **Upper** is the default.
Max Number of Files	The maximum number of files to create to contain log data to the port. These files keep a history of the data received from the port. Once this limit is exceeded, the oldest file is overwritten. The default is **10**.
Max Size of Files	The maximum allowable file size in bytes. The default is 2048 bytes. Once the maximum size of a file is reached, the SLC begins generating a new file. The default is **2048** bytes.

Syslog Logging

Syslog Logging	Select to enable system logging. ***Note:*** *The logging level for the device ports log must be set to Info to view Syslog entries for Device Port logging on the Services page.*

Note: *To apply the settings to additional device ports, in the* ***Apply settings to Device Ports field,*** *enter the additional ports, (e.g., 1-3, 5, 6)*

3. To apply settings to other device ports in addition to the currently selected port, select the **Apply** settings to Device Ports and enter port numbers separated by commas. Indicate a range of port numbers with a hyphen (e.g., 2, 5, 7-10), and separate ranges with commas.
4. To save, click the **Apply** button.

Logging Commands

The following CLI commands correspond to the web page entries described above.

To configure logging settings for one or more device ports:

Example: `set deviceport port 2-5,6,12,15-16 baud 2400 locallogging enable`

Note: *Local logging must be enabled for a device port for the* `locallog` *commands to be executed. To use the* `set locallog clear` *command, the user must have permission to clear port buffers (see 11: User Authentication).*

```
set deviceport port <Device Port List or Name> <one or more deviceport parameters>
```

Parameters:

```
emaildelay <Email Delay>
emaillogging <disable|bytecnt|charstr>
emailrestart <Restart Delay>
```

```
emailsend <email|trap|both>
emailstring <Regex String>
emailsubj <Email Subject>
emailthreshold <Byte Threshold>
emailto <Email Address>
filedir <Logging Directory>
filelogging <enable|disable>
filemaxfiles <Max # of Files>
filemaxsize <Max Size of Files>
locallogging <enable|disable>
name <Device Port Name>
nfsdir <Logging Directory>
nfslogging <enable|disable>
nfsmaxfiles <Max # of Files>
nfsmaxsize <Size in Bytes>
pccardlogging <enable|disable>
pccardmaxfiles <Max # of Files>
pccardmaxsize <Size in Bytes>
pccardslot <upper|lower>
sysloglogging <enable|disable>
```

To view a specific number of bytes of data for a device port:

`show locallog <Device Port # or Name> [bytes <Bytes To Display>]`
***1** Kbyte is the default.*

To clear the local log for a device port:

`set locallog clear <Device Port # or Name>`

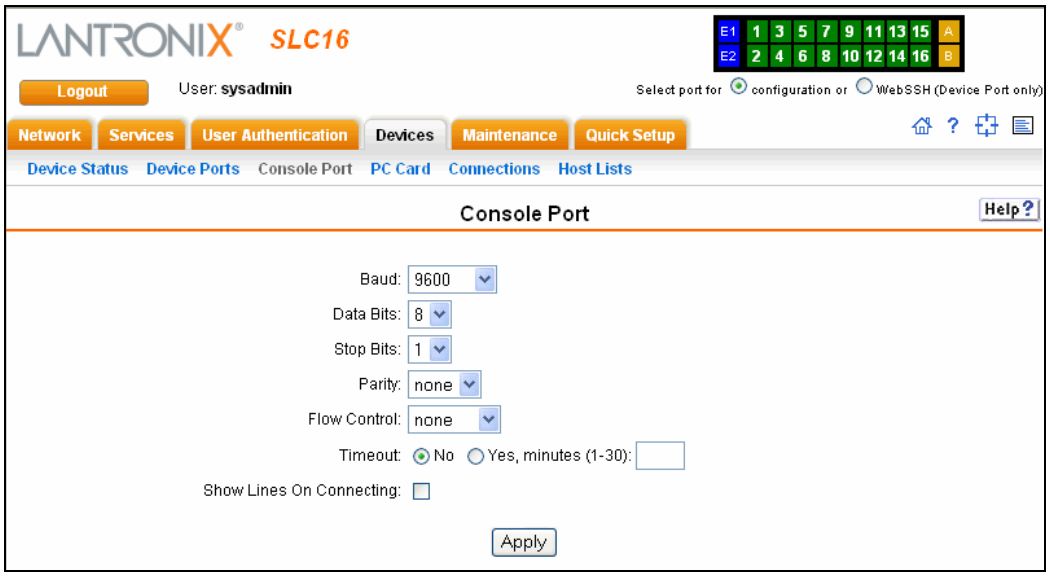
***Note:** The `locallog` commands can only be executed for a device port if local logging is enabled for the port. The `set locallog clear` command can only be executed if the user has permission to clear port buffers (see 11: User Authentication).*

Console Port

The console port initially has the same defaults as the device ports. Use the Console Port page to change the settings, if desired.

To set console port parameters:

1. Click the **Devices** tab and select **Console Port**. The following page displays:



2. Change the following as desired:

Baud	The speed with which the device port exchanges data with the attached serial device. From the drop-down list, select the baud rate. Most devices use **9600** for the administration port, so the console port defaults to this value.
Data Bits	Number of data bits used to transmit a character. From the drop-down list, select the number of data bits. The default is **8** data bits.
Stop Bits	The number of stop bits that indicate that a byte of data has been transmitted. From the drop-down list, select the number of stop bits. The default is **1**.
Parity	Parity checking is a rudimentary method of detecting simple, single-bit errors. From the drop-down list, select the parity. The default is **none**.
Flow Control	A method of preventing buffer overflow and loss of data. The available methods include none, xon/xoff (software), and RTS/CTS (hardware). The default is **none**.
Timeout	The number of minutes (1-30) after which an idle session on the console is automatically logged out. Disabled by default.
Show Lines on Connecting	If selected, when you connect to the console port with a terminal emulator, you will see the last lines output to the console, for example, the SLC boot messages or the last lines output during a CLI session on the console.

3. Click the **Apply** button to save the changes.

Console Port Commands

The following CLI commands correspond to the web page entries described above.

To configure console port settings:

```
set consoleport <one or more parameters>
```

Parameters:

```
baud <300-115200>
databits <7|8>
stopbits <1|2>
parity <none|odd|even>
flowcontrol <none|xon/xoff|rts/cts>
showlines <enable|disable>
timeout <disable|1-30>
```

To view console port settings:

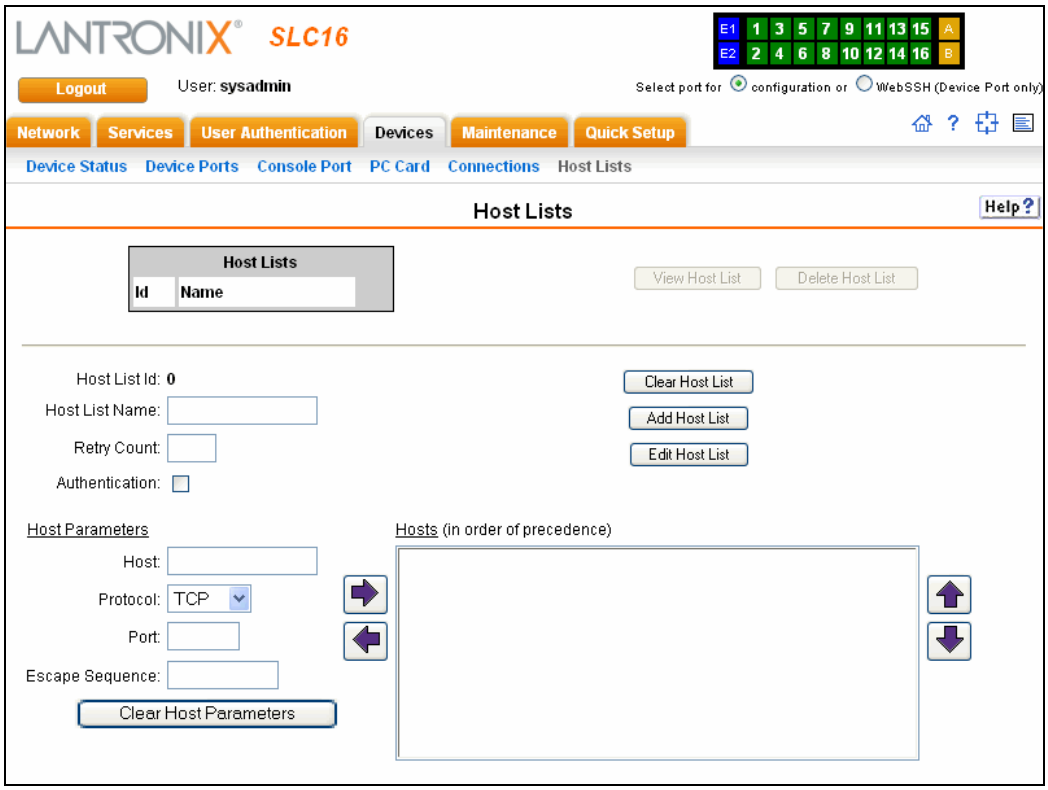
```
show consoleport
```

Host Lists

A host list is a prioritized list of SSH, Telnet, and TCP hosts available for establishing incoming modem connections or for the `connect direct` command on the CLI. The SLC cycles through the list until it successfully connects to one.

To add a host list:

1. Click the **Devices** tab and select the **Host Lists** option. The following page displays:



2. In the lower section of the page, enter the following:

Note: *To clear fields in the lower part of the page, click the* ***Clear Host List*** *button.*

Host List Id (view only)	Displays after a host list is saved.
Host List Name	Enter a name for the host list.
Retry Count	Enter the number of times the SLC should attempt to retry connecting to the host list.
Authentication	Select to require authentication when the SLC connects to a host.

3. You have the following options:

- To save the host list without adding hosts at this time, click the **Add Host List** button.
- To add host lists, enter the following:

Host Parameters

Host	Name or IP address of the host.
Protocol	Protocol for connecting to the host (TCP, SSH, or Telnet).
Port	Port on the host to connect to.

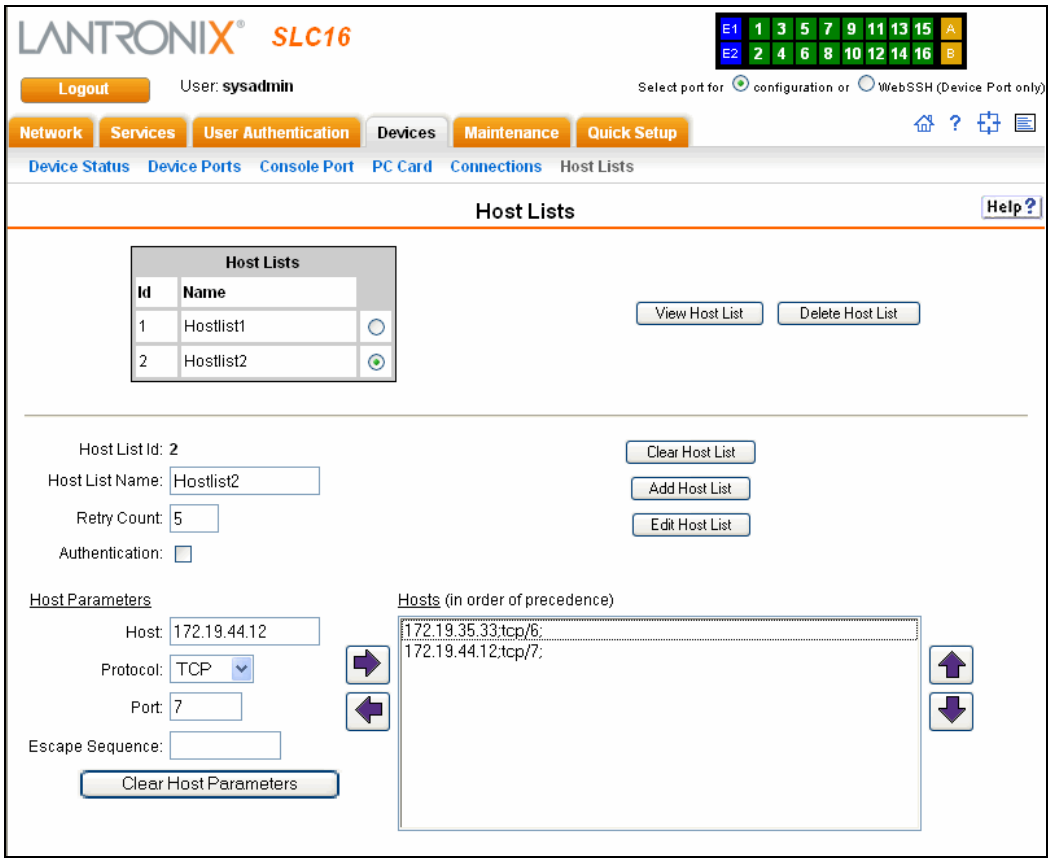
Escape Sequence	The escape character used to get the attention of the SSH or Telnet client. It is optional, and if not specified, Telnet and SSH use their default escape character. For Telnet, the escape character is either a single character or a two-character sequence consisting of '^' followed by one character. If the second character is '?', the DEL character is selected. Otherwise, the second character is converted to a control character and used as the escape character. For SSH, the escape character is a single character.

4. Click the **right arrow**. The host displays in the **Hosts** box.
5. Repeat steps 2-4 to add more hosts to the host list.

   Note: *To clear fields before adding the next host, click the* ***Clear Host Parameters*** *button.*
6. You have the following options:
   - To remove a host from the host list, select the host in the **Hosts** box and click the **left arrow**.
   - To give the host a higher precedence, select the host in the **Hosts** box and click the **up arrow**.
   - To give the host a lower precedence, select the host in the Hosts box and click the **down arrow**.
7. Click the **Add Host List** button. After the process completes, a link back to the Device Ports – Settings page displays.

To view or update a host list:

1. In the **Host Lists** table, select the host list and click the **View Host List** button. The list of hosts display in the **Hosts** box.



2. View, add, or update the following:

Host List Id (view only)	Displays after a host list is saved.
Host List Name	Enter a name for the host list.
Retry Count	Enter the number of times the SLC should attempt to retry connecting to the host list.
Authentication	Select to require authentication when the SLC connects to a host.

Host Parameters

Host	Name or IP address of the host.
Protocol	Protocol for connecting to the host (TCP, SSH, or Telnet).
Port	Port on the host to connect to SLC.

Escape Sequence	The escape character used to get the attention of the SSH or Telnet client. It is optional, and if not specified, Telnet and SSH use their default escape character. For Telnet, the escape character is either a single character or a two-character sequence consisting of '^' followed by one character. If the second character is '?', the DEL character is selected. Otherwise, the second character is converted to a control character and used as the escape character. For SSH, the escape character is a single character.

3. You have the following options:
   - To add a host to the host list, click the **right arrow**. The host displays in the **Hosts** box.
   - To remove a host from the host list, select the host in the **Hosts** box and click the **left arrow**.
   - To give the host a higher precedence, select the host in the **Hosts** box and click the **up arrow**.
   - To give the host a lower precedence, select the host in the Hosts box and click the **down arrow**.
4. Click the **Edit Host List** button. After the process completes, a link back to the Device Ports – Settings page displays.

To delete a host list:

1. Select the host list in the **Host Lists** table.
2. Click the **Delete Host List** button. After the process completes, a link back to the Device Ports – Settings page displays.

Host List Commands

The following CLI commands correspond to the web page entries described above.

To configure a prioritized list of hosts to be used for modem dial-in connections:

```
set hostlist add|edit <Host List Name> [<parameters>]
```

Parameters:

```
name <Host List Name> (edit only)
retrycount <1-10>
```
Default is 3.

```
auth <enable|disable>
```

To add a new host entry to a list or edit an existing entry:

```
set hostlist add|edit <Host List Name> entry <Host Number>
[<parameters>]
```

Parameters:

```
host <IP Address or Name>
protocol <ssh|telnet|tcp>
port <TCP Port>
escapeseq <1-10 Chars>
```

To move a host entry to a new position in the host list:

```
set hostlist edit <Host List Name> move <Host Number>
position <Host Number>
```

To delete a host list, or a single host entry from a host list:

```
set hostlist delete <Host List> [entry <Host Number>]
```

To display the members of a host list:

```
show hostlist <all|names|Host List Name>
```

9: PC Cards

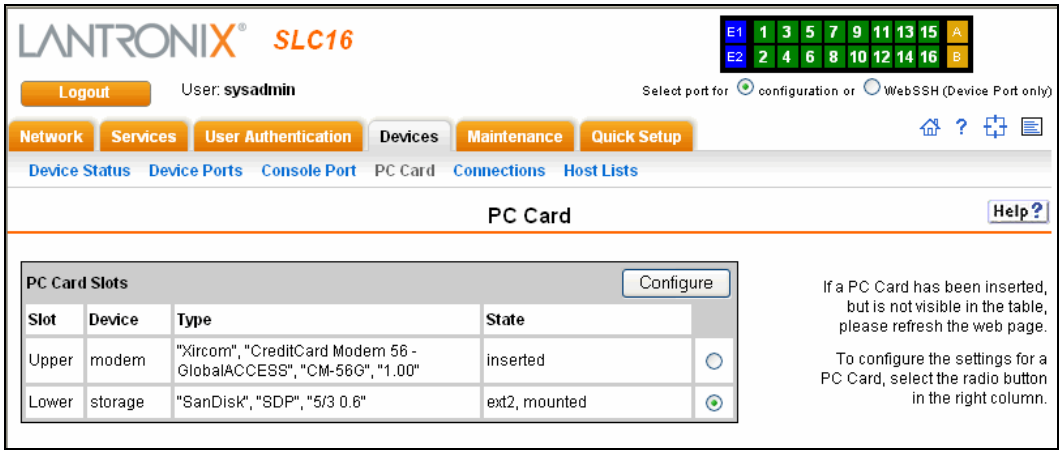
You can use the PC Card page to configure storage (Compact Flash) and modem/ISDN PC cards. A Compact Flash is useful for saving and restoring configurations (see Firmware & Configurations on page *168*) and for Device Port Logging (see *PC Card Logging* on page 90). The SLC supports a variety of Compact Flash-to-PC Card adapters, as well as modem and Basic Rate Interface (BRI) ISDN cards. (See the Lantronix web site for a complete list.)

To set up PC Card storage in the SLC:

1. Insert any of the supported PC Cards into either of the PC Card bays on the front of the SLC. (You can do this before or after powering up the SLC.)

   If the card is a compact Flash-to-PC Card adapter, and the first partition on the Compact Flash is formatted with a file system supported by the SLC (ext2 and FAT), the card mounts automatically.

2. If the card does not mount automatically, or if you want to update its settings, click the **Devices** tab and select the **PC Card** option. The following page displays.



3. From the PC Card Slots table, select the button (on the right) for the PC Card you want to configure for storage and click the **Configure** button. The following page displays.

4. Enter the following settings for the selected PC Card:

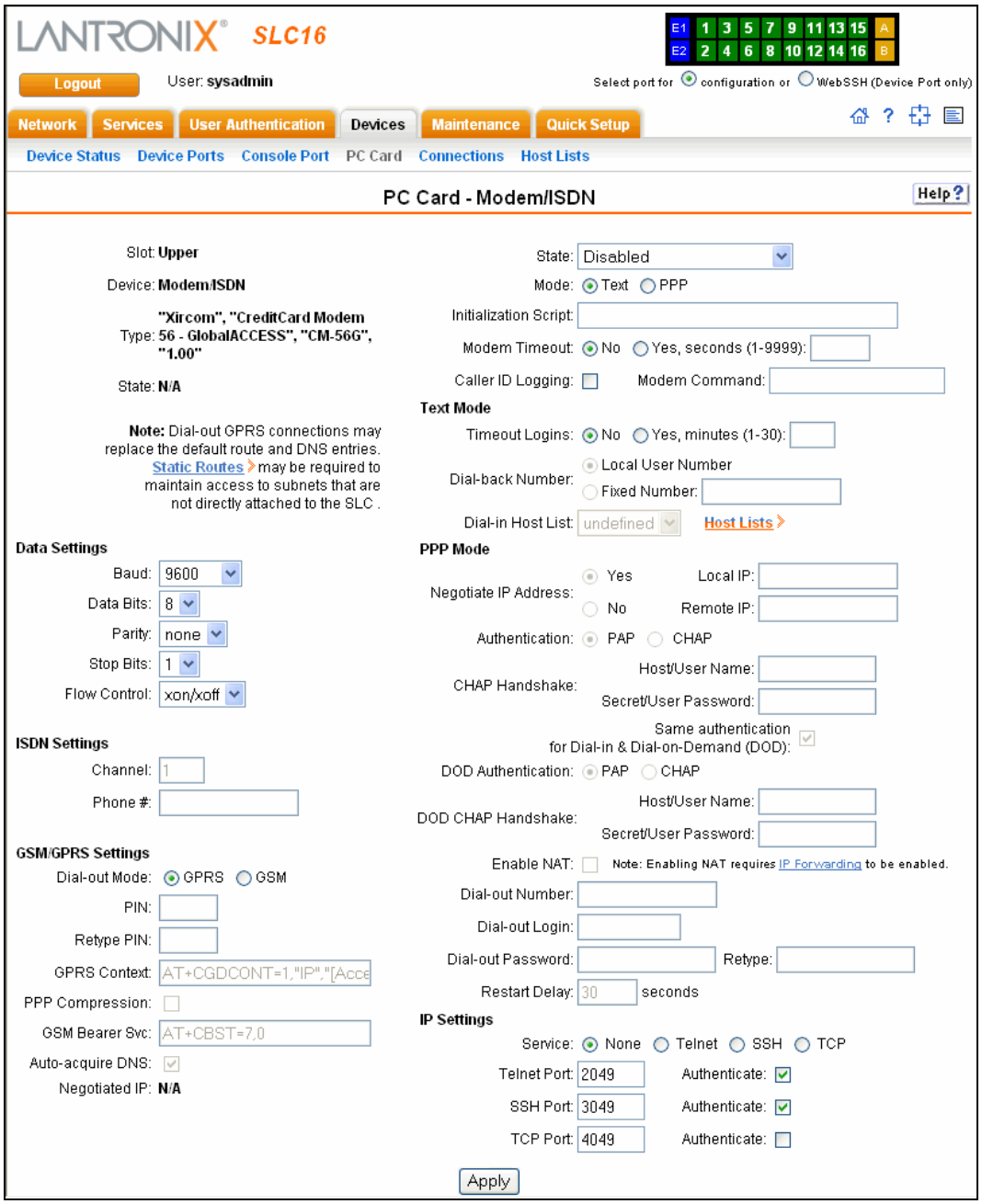
Storage Settings

Mount	Select the checkbox to mount the first partition of the Compact Flash on the SLC (if not currently mounted). Once mounted, a Compact Flash is used for device port logging and saving/restoring configurations.
Unmount	To eject the Compact Flash from the SLC, **first** unmount the Compact Flash. Select the checkbox to unmount it. ***Warning:* If you eject a Compact Flash from the SLC without unmounting it, subsequent mounts of a PC Card Compact Flash in either slot may fail, and you will need to reboot the SLC to restore PC Card functionality.**
Format	Select to unmount the Compact Flash (if it is mounted), remove all existing partitions, create one partition on the Compact Flash, format it with the selected file system (ext2 or FAT), and mount it.
Filesystem	Select ext2 or **FAT**, the file systems the SLC supports.

5. Click the **Apply** button.

To enter modem settings for a PC Card:

1. Insert any of the supported modem or ISDN cards (see www.lantronix.com/slc) into either of the PC Card bays on the front of the SLC. (You can do this before or after powering up the SLC.)
2. Click the **Devices** tab and select the **PC Card** option. The PC Card page displays.
3. Select the PC Card you want to configure from the PC Card Slots table and click the **Configure** button. The PC Card – Modem/ISDN page displays.



4. Enter or view the following:

State	Select to indicate whether to disable the PC Card or set it for dial-in, dial-out, dial-back, dial-on-demand, or dial-in & dial-on-demand. Disabled by default.

Mode	The format in which the data flows back and forth. With **Text** selected, the SLC assumes that the modem will be used for remotely logging into the command line. Text mode is only for dialing in. This is the default. **PPP** establishes an IP-based link over the modem. PPP connections can be used in dial-out mode (e.g., the SLC connects to an external network) or dial-in mode (e.g., the external computer connects to the network that the SLC is part of) or dial-on-demand. For ISDN cards, only PPP connections are allowed.
Initialization Script	Commands sent to configure the modem may have up to 100 characters. Consult your modem's documentation for recommended initialization options. If you do not specify an initialization script, the SLC uses a uses a default initialization string of **AT S7=45 SO=0 L1 V1 X4 &D2 &c1 E1 Q0**. ***Note:*** *We recommend that the modem initialization script always be preceded with* ***AT*** *and include* ***E1 V1 x4 Q0*** *so that the SLC may properly control the modem.*
Modem Timeout	Timeout for modem connections. Select **Yes** for the SLC to terminate the connection if no traffic is received during the configured idle time. Enter a value of from 1 to 9999 seconds.
Caller ID Logging	Select to enable the SLC to log caller IDs on incoming calls. ***Note:*** *For the Caller ID* ***AT*** *command, refer to the modem user guide*.
Modem Command	Modem **AT** command used to initiate caller ID logging by the modem. ***Note:*** *For the* ***AT*** *command, refer to the modem user guide*.

Data Settings

Baud	The speed with which the device port exchanges data with the attached serial device. From the drop-down list, select the baud rate. Most devices use **9600** for the administration port, so this is the default. Check the equipment settings and documentation for the proper baud rate.
Data Bits	Number of data bits used to transmit a character. From the drop-down list, select the number of data bits. The default is **8** data bits.
Parity	Parity checking is a rudimentary method of detecting simple, single-bit errors. From the drop-down list, select the parity. The default is **none**.

Stop Bits	The number of stop bit(s) used to indicate that a byte of data has been transmitted. From the drop-down list, select the number of stop bits. The default is **1**.
Flow Control	A method of preventing buffer overflow and loss of data. The available methods include none, xon/xoff (software), and RTS/CTS (hardware). The default is **none**.

ISDN Settings

Note: *These fields are disabled if the PC Card inserted is not an ISDN card.*

Channel	Select to indicate which B channel on the ISDN card to use. Valid values are 1 and 2. (The B-channel is the channel that carries the main data.) Only one 64K channel can be used at a time.
Phone Number	Phone number associated with the B channel. May have up to 20 characters. Any format is acceptable.

GSM/GPRS Settings

These settings are only active when a GSM/GPRS PC card modem is in the appropriate slot.

Notes:

- *Please consult your wireless carrier's configuration requirements for more detailed information.*
- *Dial-out GPRS connections may replace the default route and DNS entries. Static routes may be required to maintain access to subnets that are not directly attached to the SLC. Click the **Static Routes** link (above **Data Settings**) to configure a static route. (See Routing on page 52.)*

Dial-out Mode	Select the type of dial-out connection: **GPRS:** (General Packet Radio Service) **GSM:** (Global System for Mobile communication)
PIN and Retype PIN	PIN (personal identification number) for accessing the GSM/GPRS card.
GPRS Context	Command to specify the protocol data packet (PDP) context parameter values.
PPP Compression	Select to enable negotiation of data compression over PPP links. Disabled by default.
GSM Bearer Svc.	Command to select the bearer service, data rate, and connection element to use when data call originate.
Auto-acquire DNS	Select to enable the SLC to acquire up to three DNS servers by means of GPRS. Enabled by default.
Negotiated IP	IP address associated with the GPRS connection.

Text Mode

Timeout Logins	If you selected **Text** mode, you can enable logins to time out after the connection is inactive for a specified number of minutes. The default is **No**. This setting only applies to text mode connections. **PPP** mode connections stay connected until either side drops the connection. Disabled by default.
Dial-back Number	Users with dial-back access can dial into the SLC and enter their login and password. Once the SLC authenticates them, the modem hangs up and dials them back. Select the phone number the modem dials back on--a fixed number or a number associated with their login. If you select Fixed **Number**, enter the number (in the format 2123456789).
Dial-in Host List	From the drop-down list, select the desired host list. The host list is a prioritized list of SSH, Telnet and TCP hosts that are available for establishing outgoing modem connections. The hosts in the list are cycled through until the modem successfully connects to one. To establish and configure host lists, click the **Host Lists** link. (See *Host Lists* on page 97.)

PPP Mode

Negotiate IP Address	If the SLC and/or the serial device have dynamic IP addresses (e.g., IP addresses assigned by a DHCP server), select **Yes**. This is the default. If the SLC or the modem have fixed IP addresses, select **No,** and enter the **Local IP** (IP address of the port) and **Remote IP** (IP address of the modem).
Authentication	Enables **PAP** or **CHAP** authentication for modem logins. **PAP** is the default. With PAP, users are authenticated by means of the Local Users and any of the remote authentication methods that are enabled. With CHAP, the **CHAP Handshake** fields authenticate the user.
CHAP Handshake	The host/username (for UNIX systems) or secret/user password (for Windows systems) used for CHAP authentication. May have up to 128 characters.
Same authentication for Dial-in & Dial-on-Demand (DOD)	Select this option to let incoming connections (dial-in) use the same authentication settings as outgoing connections (dial-on-demand). If this option is not selected, then the dial-on-demand connections take their authentication settings from the DOD parameter settings. If **DOD Authentication** is PAP, then the **DOD CHAP Handshake** field is not used.

DOD Authentication	Enables **PAP** or **CHAP** authentication for dial-in & dial-on-demand. **PAP** is the default. With PAP, users are authenticated by means of the Local Users and any of the remote authentication methods that are enabled. With CHAP, the **DOD CHAP Handshake** fields authenticate the user.
DOD CHAP Handshake	For **DOD Authentication**, enter the host/username for UNIX systems) or secret/user password (for Windows systems) used for CHAP authentication. May have up to 128 characters.
Enable NAT	Select to enable Network Address Translation (NAT) for dial-in and dial-out PPP connections on a per modem (Device Port or PC Card) basis. Users dialing into the SLC access the network connected to Eth1 and/or Eth2. ***Note:*** *IP forwarding must be enabled on the Network - Settings page for NAT to work. To enable, click the* ***IP Forwarding*** *link to display the Network Settings page. See*
Dial-out Number	Phone number for dialing out to a remote system or serial device. May have up to 20 characters. Any format is acceptable.
Dial-out Login	User ID for dialing out to a remote system. May have up to 32 characters.
Dial-out Password and **Retype**	Password for dialing out to a remote system. May have up to 64 characters.
Restart Delay	The number of seconds after the timeout and before the SLC attempts another connection. The default is **30** seconds.

IP Settings

Service	The available connection services for this modem port (Telnet, SSH, or TCP). Only one can be active at a time. The default is **None**.
Telnet Port	Telnet session port number to use if you selected **Telnet**. Defaults: Upper PC Card Slot: **2049** Lower PC Card Slot: **2050** Range: **1025-65535**
SSH Port	The SSH session port number to use if you selected **SSH**. Defaults: Upper PC Card Slot: **3049** Lower PC Card Slot: **3050** Range: **1025-65535**
TCP Port	The TCP (raw) session port number to use if you selected **TCP**. Defaults: Upper PC Card Slot: **4049** Lower PC Card Slot: **4050** Range: **1025-65535**

Authenticate	If selected, the SLC requires user authentication before granting access to the port. **Authenticate** is selected by default for **Telnet Port** and **SSH Port,** but not for **TCP Port**.

5. Click the **Apply** button.

PC Card Commands

These commands for the command line interface correspond to the web page entries described above.

PC Card Storage Commands

To mount a Compact Flash card in the SLC for use as a storage device:

Note: *The Compact Flash card must be formatted with an ext2 or FAT file system before you mount it.*

```
pccard storage mount <upper|lower>
```

To view a directory listing of a Compact Flash card:

```
pccard storage dir <upper|lower>
```

To unmount a Compact Flash card:

Note: *Enter this command before ejecting the card.*

```
pccard storage unmount <upper|lower>
```

To format a Compact Flash card:

```
pccard storage format <upper|lower> [filesystem <ext2|fat>]
```

To rename a file on a Compact Flash card:

```
pccard storage rename <upper|lower> file <Filename> newfile <New Filename>
```

To copy a file on a Compact Flash card:

```
pccard storage copy <upper|lower> file <Filename> newfile <New Filename>
```

Removes a file on a Compact Flash card:

```
pccard storage delete <upper|lower> file <Current Filename>
```

PC Card Modem Commands

To configure a currently loaded PC Card modem:

```
pccard modem <upper|lower> <parameters>
```

Parameters:

auth <pap|chap>

baud <300-115200> ***9600** is the default.*

calleridcmd <Modem Command String>

calleridlogging <enable| **disable**>

chaphost <CHAP Host or User Password>

chapsecret <CHAP Secret or User Password>

databits <7|**8**>

dialbacknumber <usernumber|Phone Number>

dialinlist <Host List for Dial-in>

dodauth <pap|chap>

dodchaphost <CHAP Host or User Name>

dodchapsecret <CHAP Secret or User Password>

dialoutlogin <User Login>

dialoutnumber <Phone Number>

dialoutpassword <Password>

flowcontrol <**none**|xon/xoff|rts|cts>

gsmautodns <**enable**|disable>

gsmbearerservice <GSM Bearer Service>

gsmcompression <enable|**disable**>

gsmcontext <GPRS Context Id>

gsmdialoutmode <**gprs**|gsm>

gsmpin <GSM/GPRS PIN Number>

idletimeout <disable|1-9999 seconds>

initscript <Initialization Script>

isdnchannel <1|2>

isdnnumber <Phone Number>

localipaddr <negotiate|IP Address>

modemmode <**text**|ppp>

modemstate
<**disable**|dialout|dialin|dialback|dialondemand|
dialin+dialondemand> <dialinhostlist>

modemtimeout <disable|1-9999 sec>

nat <enable|**disable**>

parity <**none**|odd|even>

remoteipaddr <negotiate|IP Address>

restartdelay <PPP Restart Delay>

service <**none**|telnet|ssh|tcp>

sshauth <**enable**|disable>

sshport <TCP Port>

stopbits <**1**|2>

```
tcpauth <enable|disable>
tcpport <TCP Port>
telnetauth <enable|disable>
telnetport <TCP Port>
timeoutlogins <disable|1-30>
```

10: Connections

Chapter 8: Devices described how to configure and interact with an SLC device port connected to an external device. This chapter describes how to use the Connections web page to connect external devices and outbound network connections (such as Telnet or SSH) in various configurations.

An SLC device port attached to an external device can be connected to one of the following endpoints:

- Another device port attached to an external device
- Another device port with a modem attached
- An outgoing Telnet or SSH session
- An outgoing TCP or UDP network connection

This enables the user to set up connections such as those described in the next section.

You can establish a connection at various times:

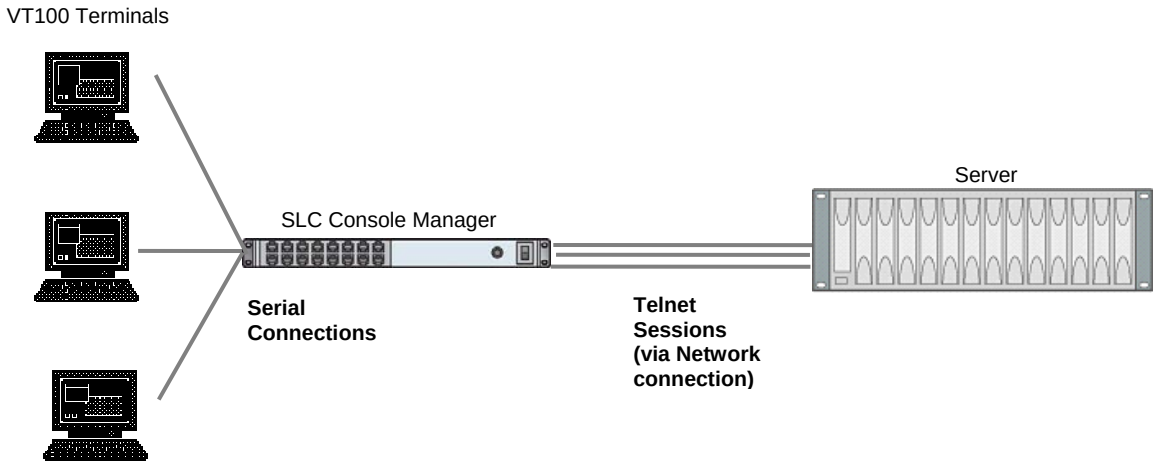
- Immediately. These connections are always re-established after reboot.
- At a specified date and time. These connections connect if the date and time have already passed.
- After a specified amount of data or a specified sequence of data passes through the connection. Following reboot, the connection is not reestablished until the specified data passes through the connection.

Typical Setup Scenarios for the SLC

Following are typical configurations in which SLC connections can be used, with references to settings on the Connections and Device Ports web pages.

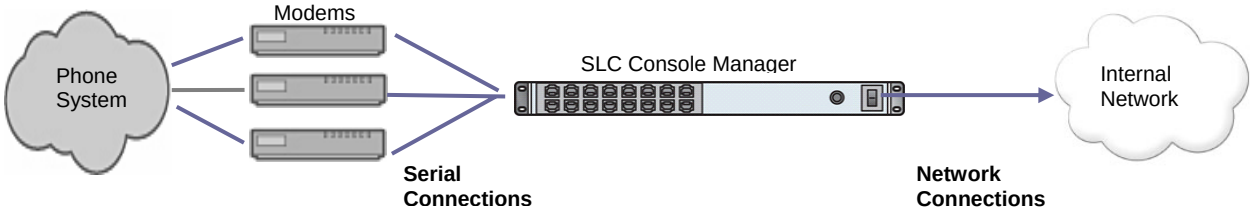
Terminal Server

In this setup, the SLC acts as a multiplexer of serial data to a single server computer. Terminal devices are connected to the serial ports of the SLC and configured as a **Device Port to Telnet out** type connection on the Connections page. The users of the terminals can access the server as if they were connected directly to it by local serial ports or a console.



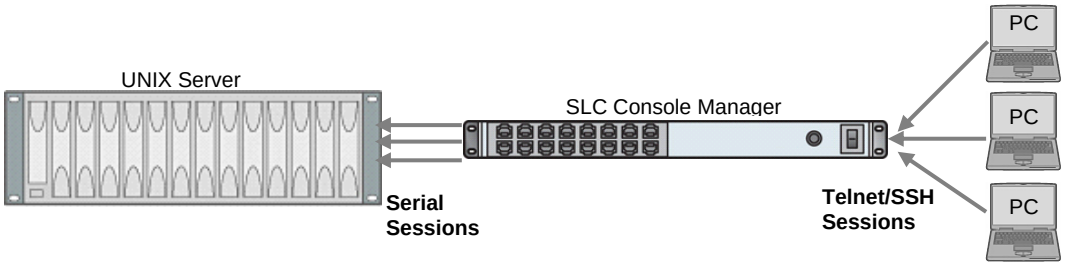
Remote Access Server

In this setup, the SLC is connected to one or more modems by its device ports. Configure the device ports on the Device Ports - Settings web page by selecting the **Dial-in** option in the Modem Settings section. Most customers use the modems in PPP mode to establish an IP connection to the SLC and either Telnet or SSH into the SLC. They could also select text mode where, using a terminal emulation program, a user could dial into the SLC and connect to the command line interface.



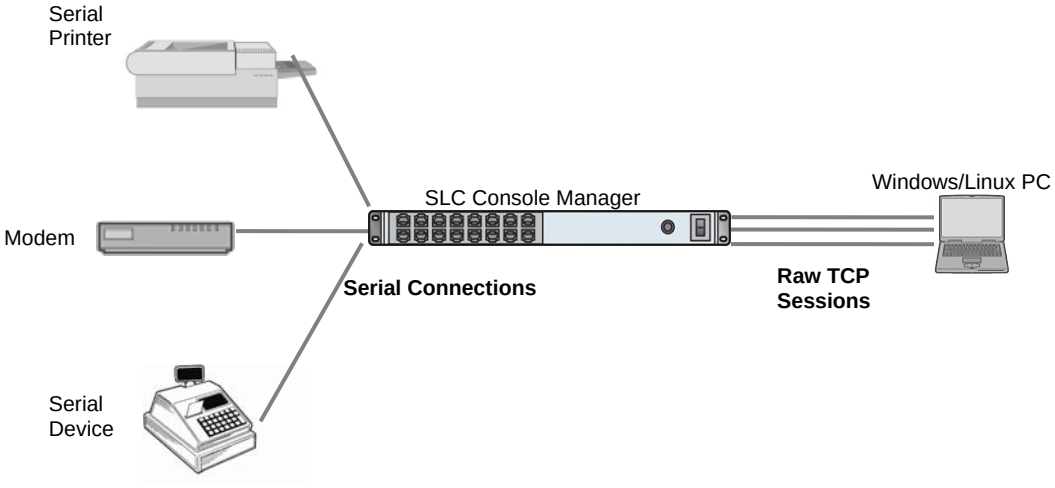
Reverse Terminal Server

In this scenario, the SLC has one or more device ports connected to one or more serial ports of a mainframe server. Users can access a terminal session by establishing a Telnet or SSH session to the SLC. To configure the SLC, select the **Enable Telnet In** or **Enable SSH In** option on the Device Ports – Settings web page.



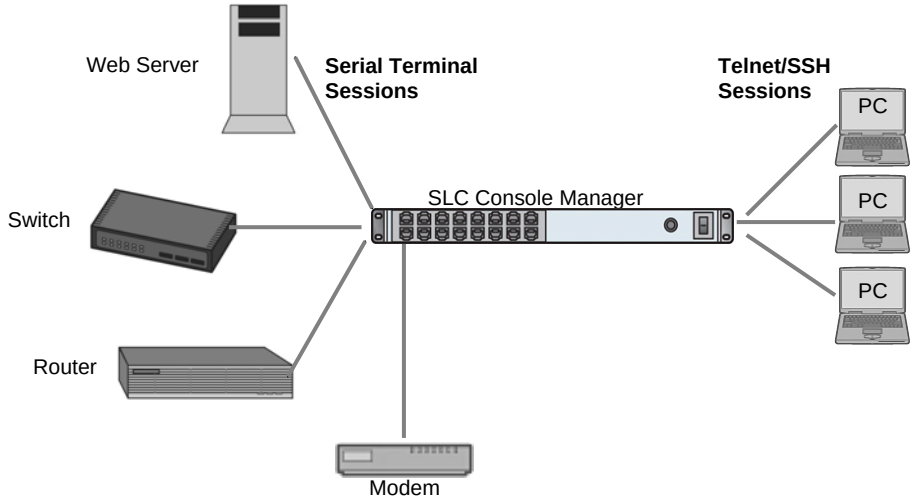
Multiport Device Server

A PC can use the device ports on the SLC as virtual serial ports, enabling the ports to act as if they are local ports to the PC. To use the SLC in this setup, the PC requires special software, for example, Com Port Redirector (available on www.lantronix.com) or similar software).



Console Server

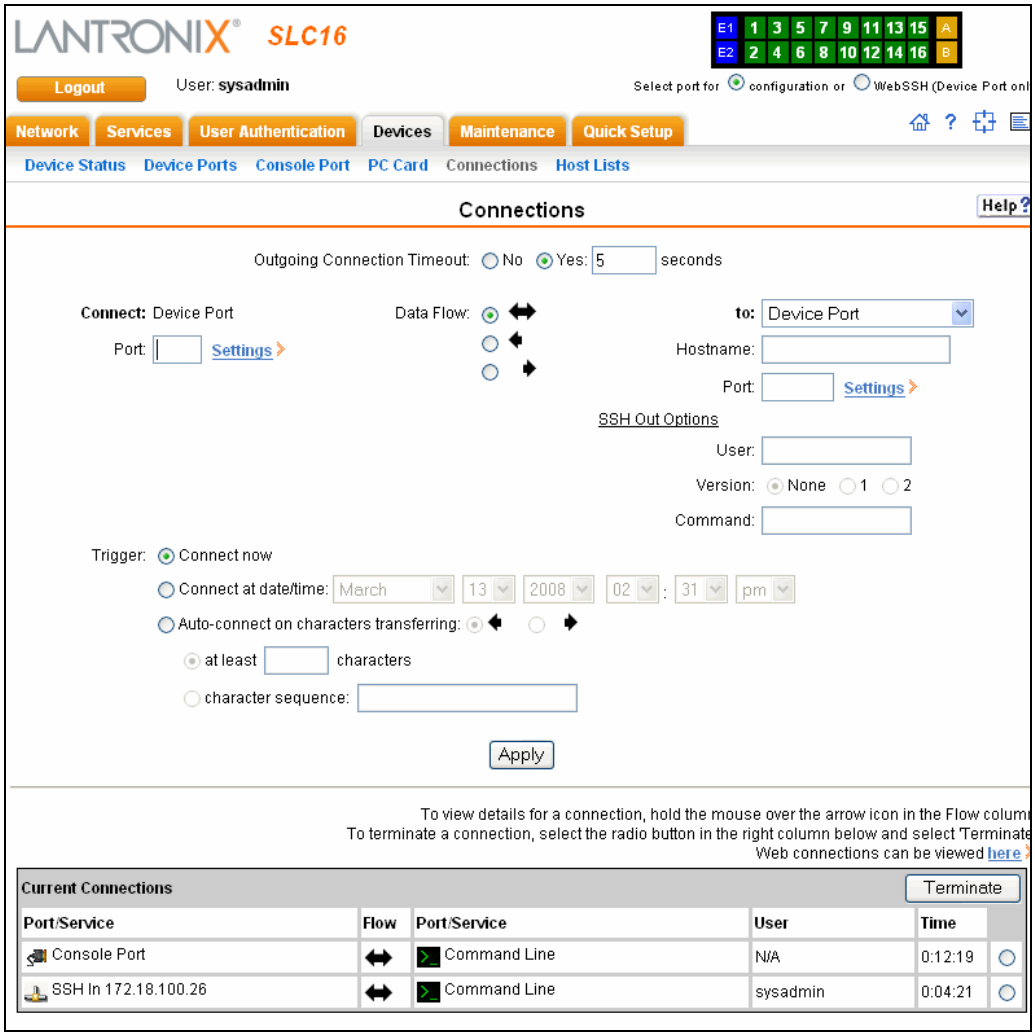
For this situation, the SLC is configured so that the user can manage a number of servers or pieces of network equipment using their console ports. The device ports on the SLC are connected to the console ports of the equipment that the user would like to manage. To manage a specific piece of equipment, the user can Telnet or SSH to a specific port or IP address on the SLC and be connected directly to the console port of the end server or device. To configure this setup, set the **Enable Telnet In** or **Enable SSH In** option on the Device Ports – Settings web page for the device port in question. The user can implement an extra remote management capability by adding a modem to one of the device ports and setting the **Dial-in** option in the Modem Settings section of the Device Ports – Settings web page. A user could then dial into the SLC using another modem and terminal emulation program at a remote location.



Connection Configuration

To create a connection:

1. Click the **Devices** tab and select the **Connections** opton. The following page displays:



2. For a device port, enter the following:

Port	The number of the device port you are connecting. This device port must be connected to an external serial device and must *not* have command line interface logins enabled, be connected to a modem, or be running a loopback test. ***Note:*** *To see the current settings for this device port, click the* ***Settings*** *link.*

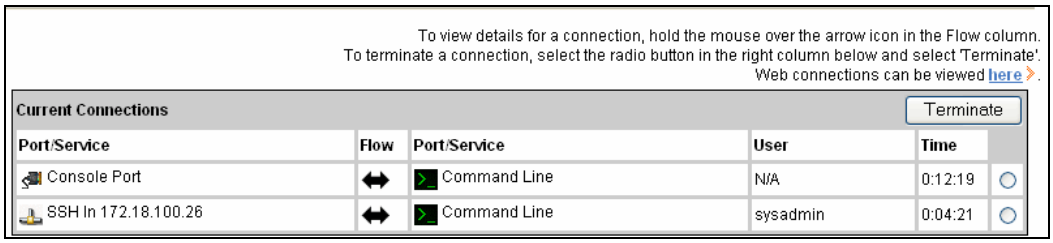
Data Flow	Select the arrow showing the direction (bidirectional or unidirectional) the data will flow in relationship to the device port you are connecting.
to	From the drop-down list, select a destination for the connection: a device port connected to a serial device, a device port connected to a modem, or an outbound network connection (Telnet, SSH, TCP Port, or UDP Port). ***Note:*** *To see the current settings for a selected device port, click the* ***Settings*** *link.*
Hostname	The host name or IP Address of the destination. This entry is required if the **to** field is set to Telnet out, SSH out, TCP port, or UDP port.
Port	If the **to** field is set to **Device Port** or **Modem on Device Port**, enter the number of the device port. For all other options, this is the TCP/UDP port number, which is optional for Telnet out and SSH out, but required for TCP Port and UDP Port. ***Notes:*** *If you select* ***Device Port,*** *it must not have command line interface logins enabled or be running a loopback test.* *To view the device port's settings, click the* ***Settings*** *link to the right of the port number.*
SSH Out Options	Select one of the following optional flags to use for the SSH connection. **User:** Login ID to use for authenticating on the remote host. **Version:** Version of SSH. Select **1** or **2**. **Command:** Enter a specific command on the remote host (for example, `reboot`).

Trigger	Select the condition that will trigger a connection. Options include: **Connect now**: Connects immediately, or if you reboot the SLC, immediately on reboot. **Connect at date/time**: Connects at a specified date and time. Use the drop-down lists to complete the date and time. Upon rebooting, the SLC reestablishes the connection if the date/time has passed. **Auto-connect on characters transferring**: Select the arrow indicating the direction of the data transfer and either the minimum number of characters or a specific character sequence that will trigger the connection. You can select the direction of the data transfer only if **Data Flow** is bidirectional. Upon rebooting, the SLC does not reestablish the connection until the specified data has passed through one of the endpoints of the connection.

3. To save, click the **Apply** button.

To view, update, or disconnect a current connection:

The bottom of the Connections web page displays current connections.



1. To view details about a connection, hold the mouse over the arrow in the **Flow** column.
2. To disconnect (delete) a connection, select the connection in the **Select** column and click the **Terminate** button.
3. To reestablish the connection, create the connection again in the top part of the page.
4. To view information about Web connections, click the **here** link in the text above the table. The Firmware & Configurations - Web Sessions page displays.

Connection Commands

These commands for configuring connections correspond to the web page entries described above.

To connect to a device port to monitor and/or interact with it, or to establish an outbound network connection:

```
connect direct <endpoint>
```

Endpoint is one of:

```
deviceport <Port # or Name>
ssh <IP Address or Name> [port <TCP Port>] [<SSH flags>]
```

where `<SSH flags>` is one or more of:

```
user <Login Name>
version <1|2>
command <Command to Execute>
tcp <IP Address> [port <TCP Port>]
telnet <IP Address or Name> [port <TCP Port>]
udp <IP Address> [port <UDP Port>]
hostlist <Host List>
```

To configure initial timeout for outgoing connections:

Note: *This is not a TCP timeout.*

```
connect global outgoingtimeout <disable|1-9999 seconds>
```

To monitor a device port:

```
connect listen deviceport <Device Port # or Name>
```

To connect a device port to another device port or an outbound network connection (data flows in both directions):

```
connect bidirection <Port # or Name> <endpoint>
```

Endpoint is one of:

```
charcount <# of Chars>
charseq <Char Sequence>
charxfer <toendpoint|fromendpoint>
deviceport <Device Port # or Name>
date <MMDDYYhhmm[ss]>
exclusive <enable|disable>
ssh <IP Address or Name> [port <TCP Port] [<SSH flags>]
      where <SSH flags> is one or more of:
      user <Login Name>
      version <1|2>
      command <Command to Execute>
tcp <IP Address> [port <TCP Port>]
telnet <IP Address or Name> [port <TCP Port>]
trigger <now|datetime|chars>
udp <IP Address> [port <UDP Port>]
```

Note: *If the trigger is `datetime` (establish connection at a specified date/time), enter the date parameter. If the trigger is `chars` (establish connection on receipt of a specified number or characters or a character sequence), enter the `charxfer` parameter and either the `charcount` or the `charseq` parameter.*

To connect a device port to another device port or an outbound network connection (data flows in one direction):

```
connect unidirection <Device Port # or Name> dataflow
<toendpoint|fromendpoint> <endpoint>
```

Endpoint is one of:

```
charcount <# of Chars>
charseq <Char Sequence>
datetime <MMDDYYhhmm[ss]>
deviceport <Port # or Name>
exclusive <enable|disable>
ssh <IP Address or Name> [port <TCP Port] >]
<SSH flags>]
      where <SSH flags> is one or more of:
      user <Login Name>
      version <1|2>
```

```
command <Command to Execute>
tcp <IP Address> [port <TCP Port>]
telnet <IP Address or Name> [port <TCP Port]
trigger <now|datetime|chars>
udp <IP Address> [port <UDP Port>]
```

Note: *If the trigger is* `datetime` *(establish connection at a specified date/time), enter the date parameter. If the trigger is* `chars` *(establish connection on receipt of a specified number or characters or a character sequence), enter either the* `charcount` *or the* `charseq` *parameter.*

To terminate a bidirectional or unidirectional connection:

```
connect terminate <Connection ID>
```

To view connections and their IDs:

Note*: The connection IDs are in the left column of the resulting table. The connection ID associated with a particular connection may change if the connection times out and is restarted.*

```
show connections [email <Email Address>].
```
You can optionally email the displayed information.

To display details for a single connection:
You can optionally email the displayed information.

```
show connections connid <Connection ID> [email <Email Address>
```

To display global connections:

```
connect global show
```

11: User Authentication

Users who attempt to log in to the SLC by means of Telnet, SSH, the console port, or one of the device ports are granted access by one or more authentication methods.

The User Authentication page provides a submenu of methods (Local Users, NIS, LDAP, RADIUS, Kerberos, and TACACS+) for authenticating users attempting to log in. Use this page to assign the order in which the SLC will use the methods. By default, local user authentication is enabled and is the first method the SLC uses to authenticate users. If desired, you can disable local user authentication or assign it a lower precedence.

Note: *Regardless of whether local user authentication is enabled, the local user sysadmin account is always available for login.*

Authentication can occur using all methods, in the order of precedence, until a successful authentication is obtained, or using only the first authentication method that responds (in the event that a server is down).

If you have the same user name defined in multiple authentication methods, the result is unknown.

Example:

There is an LDAP user "joe" and an NIS user "joe" and the order of authentication methods is:

1 - Local Users

2 - LDAP

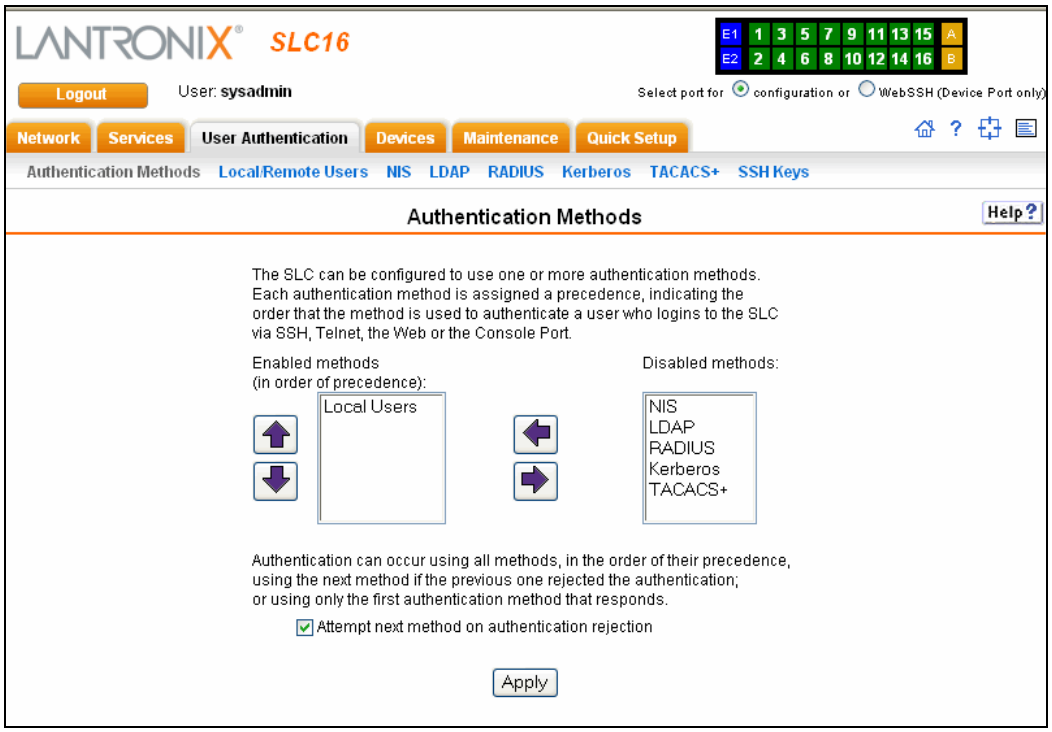
3 - NIS

User "joe" tries to log in. Because there is an LDAP user "joe," the SLC tries to authenticate him against his LDAP password first. If he fails to log in, then the SLC may (or may not) try to authenticate him against his NIS "joe" user password.

Authentication Methods

To enable, disable, and set the precedence of authentication methods:

1. Click the User Authentication tab and select the **Authentication Methods** option. The following page displays:



2. To enable a method currently in the **Disabled methods** list, select the method and press the **left arrow** to the left of the list. The methods include:

NIS (Network Information System)	A network naming and administration system developed by Sun Microsystems for smaller networks. Each host client or server computer in the system has knowledge about the entire system. A user at any host can access files or applications on any host in the network with a single user identification and password. NIS uses the client/server model and the Remote Procedure Call (RPC) interface for communication between hosts. NIS consists of a server, a library of client programs, and some administrative tools. NIS is often used with the Network File System (NFS).
LDAP (Lightweight Directory Access Protocol)	A set of protocols for accessing information directories, specifically X.500-based directory services. LDAP runs over TCP/IP or other connection-oriented transfer services.
RADIUS (Remote Authentication Dial-In User Service)	An authentication and accounting system used by many Internet Service Providers (ISPs). A client/server protocol, it enables remote access servers to authenticate dial-in users and authorize their access to the requested system or service. RADIUS allows a company to maintain user profiles in a central database that all remote servers can share. It increases security, allowing a company to set up a policy that can be applied at a single administered network point.
Kerberos	Kerberos is a network authentication protocol that enables two parties to exchange private information across an unprotected network. It works by assigning a unique electronic credential, called a *ticket,* to each user who logs on to the network. The ticket is embedded in messages to identify the sender.

TACACS+ (Terminal Access Controller Access Control System)	TACACS+ allows a remote access server to communicate with an authentication server to determine whether the user has access to the network. TACACS+ is a completely new protocol and is not compatible with TACACS or XTACACS. The SLC supports TACACS+ only.
Local Users	Local accounts authenticate users who attempt to log in via SSH, Telnet, the Web, or the console port.

3. To disable a method currently in the **Enabled methods** list, select the method and click the **right arrow** between the lists.
4. To set the order in which the SLC will authenticate users, use the **up** and **down arrows** to the left of the **Enabled methods** list.
5. For **Attempt next method on authentication rejection**, you have the following options:
   - To enable the SLC to use all methods, in order of precedence, until it obtains a successful authentication, select the check box. This is the default.
   - To enable the SLC to use only the first authentication method that responds (in case a server is down or unavailable), clear the check box.
6. Click the **Apply** button.

Now that you have enabled one or more authentication methods, you must configure them.

Authentication Commands

The following command for the command line interface corresponds to the web page entries described above.

To set ordering of authentication methods:

Note: *Local Users authentication is always the first method used. Any methods omitted from the command will be disabled.*

```
set auth <one or more parameters>
```

Parameters:

```
authusenextmethod <enable|disable>
kerberos <1-6>
ldap <1-6>
localusers <1-6>
nis <1-6>
radius <1-6>
tacacs+ <1-6>
```

To view authentication methods and their order of precedence:

```
show auth
```

User Rights

The SLC has three default user groups: Administrators, Power Users, and Default Users. Each has a predefined set of rights; users inherit rights from the user group to which they belong. These rights are in addition to the current functions that a user can perform at the CLI:

```
connect direct/listen

set locallog/password/history/cli

show datetime/deviceport/locallog/portstatus/portcounters/
history/cli/user
```

The table below shows the mapping of groups and user rights.

Table 11-1. User Group Rights

User Right	Administrators	Power Users	Default Users
Full Administrative	•		
Networking	•	•	
Services	•		
SecureLinx Network	•		
Date/Time	•	•	
Local Users	•		
Remote Authentication	•		
SSH Keys	•		
User Menus	•		
Web Access	•	•	
Reboot/Shutdown	•	•	
Firmware/Configuration	•		
Diagnostics and Reports	•	•	
Device Ports	•		
PC Card	•		

You cannot deny a user rights defined for the group, but you can add or remove all other rights at any time.

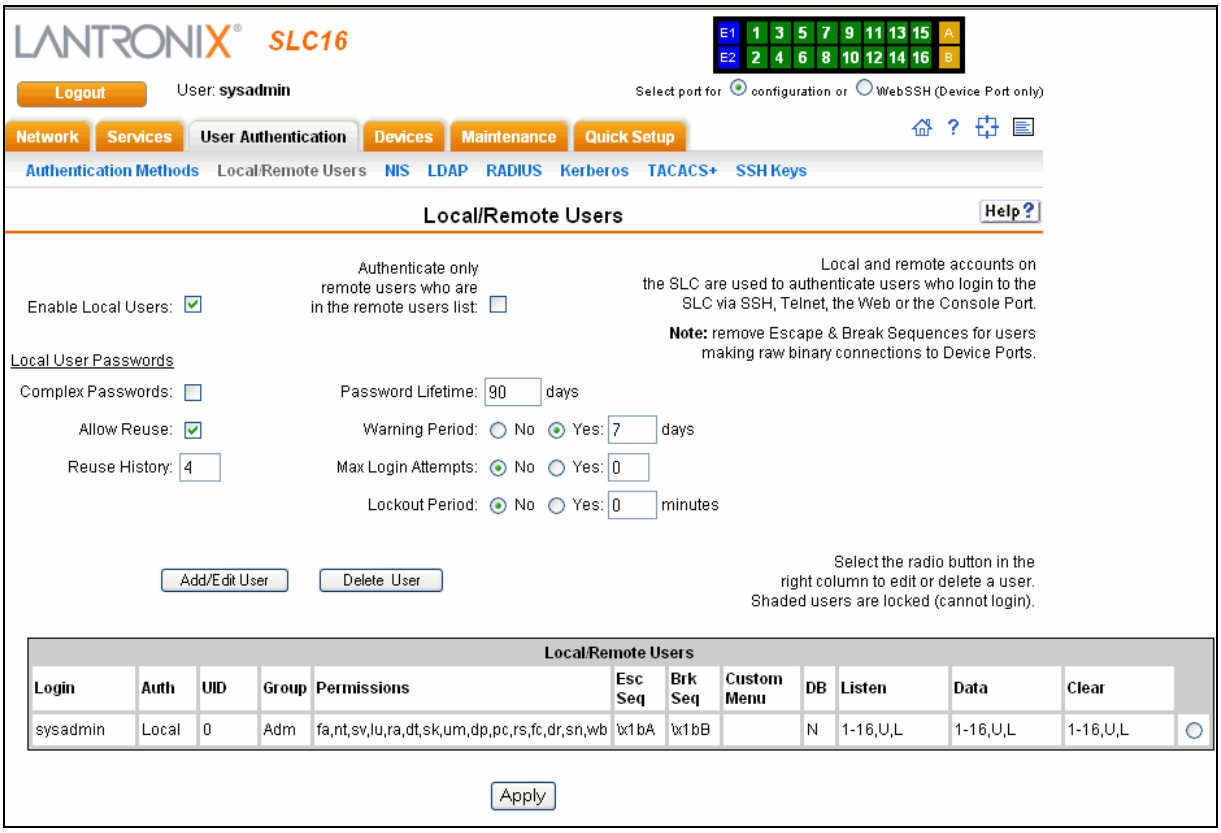
By default, the system assigns new users to the Default Users group, but you can change their group membership at any time. If you change a user's rights while the user is logged into the web or CLI, the results do not take effect until the next time the user logs in.

See *Local/Remote User Settings* on page 129 for information about assigning rights to users.

Local and Remote Users

The system administrator can configure the SLC to use local accounts and remote accounts to authenticate users.

1. Click the **User Authentication** tab and select the **Local/Remote Users** option. The following page displays.



The top of the page has entry fields for enabling local and remote users and for setting password requirements. The bottom of the page displays a table listing and describing all local and remote users.

To enable local and/or remote users:

1. Enter the following:

Enable Local Users	Select to enable all local users except sysadmin. The sysadmin is always available regardless of how you set the check box. Enabled by default.
Authenticate only users who are in the remote users list	Select the check box to authenticate users listed in the **Remote Users** list in the lower part of the page. Disabled by default.

2. Click the **Apply** button.

To set password requirements for local users:

Local User Passwords

Complex Passwords	Select to enable the SLC to enforce rules concerning the password structure (e.g., alphanumeric requirements, number of characters, punctuation marks). Disabled by default. **Complexity rules:** Passwords must be at least eight characters long. They must contain one upper case letter (A-Z), one lower case letter (a-z), one digit (0-9), and one punctuation character (()`~!@#$%%^&*-+=\{}[]:;'"<>,.?/_).
Allow Reuse	Select to enable users to continue to reuse old passwords. If you disable the check box, they cannot use any of the **Reuse History** number of passwords. Enabled by default.
Reuse History	The number of passwords the user must use before reusing an old password. The default is 4. For example, if you set reuse history to 4, the user may reuse an old password after using 4 other passwords.
Lifetime (days)	The number of days until the password expires. The default setting is **90**.
Warning Period (days)	The number of days ahead that the system warns that the user's password will expire. The default setting is **7**.
Max Login Attempts	The number of times (up to 8) the user can attempt to log in unsuccessfully before the system locks the user out. The default setting is **0** (disabled).
Lockout Time (minutes)	The number of minutes (up to 90) the locked-out user must wait before trying to log in to the web interface again. The default setting is **0** (disabled).

3. Click the **Apply** button.

To add, edit, or delete a user:

You can delete a user listed in the table on this page or open the page for adding or editing a user.

You have the following options:

- To add a user, click the **Add/Edit User** button. The Local/Remote User Settings page displays. (See *Local/Remote User Settings* below)
- To edit a user, select the user in the table and click the **Add/Edit User** button. The Local/Remote User Settings page displays. (See Local/Remote User Settings on page129.)
- To delete a user, select the user in the table, click the **Delete** button, and then click the **Apply** button.

Local/Remote User Settings

On this page, you can add, edit, or delete a local or remote user.

To add a user:

1. On the Local/Remote Users page (described above), click the **Add/Edit User** button. The Local/Remote User Settings page displays.

2. Enter the following information for the user:

Login	User ID of selected user.
Authentication	Select the type of authenticated user: **Local:** User listed in the SLC database. **Remote:** User not listed in the SLC database.
UID	A unique numeric identifier the system administrator assigns to each user. Valid UIDs are 101-4294967295. ***Note:*** *The UID must be unique. If it is not, SLC automatically increments it. Starting at 101, the SLC finds the next unused UID.*
Listen Ports	The device ports that the user may access to view data using the `connect listen` command. Enter the port numbers or the range of port numbers (for example, 1, 5, 8, 10-15). **U** and **L** denote the PC Card upper and lower slots.

Data Ports	The device ports with which the user may interact using the `connect direct` command. Enter the port numbers or the range of port numbers.
Clear Port Buffers	The device port buffers the users may clear using the `set locallog clear` command. Enter the port numbers or the range of port numbers.
Enable for Dial-back	Select to grant a local user dial-back access (see *Device* Ports – Settings on page 76). Users with dial-back access can dial into the SLC and enter their login and password. Once the SLC authenticates them, the modem hangs up and dials them back. Disabled by default.
Dial-back Number	The phone number the modem dials back on depends on this setting for the device port. The user is either dialed back on a fixed number (specified on the Device Port - Settings page), or on a number that is associated with the user's login (specified here).
Escape Sequence	A single character or a two-character sequence that causes the SLC to leave direct (interactive) mode. (To leave listen mode, press any key.) A suggested value is **Esc+A** (escape key, then uppercase "A" performed quickly but not simultaneously). You would specify this value as **\x1bA**, which is hexadecimal **(\x)** character 27 (**1B**) followed by an **A**. This setting allows the user to terminate the `connect direct` command on the command line interface when the endpoint of the command is `deviceport`, `tcp`, or `udp`.
Break Sequence	A series of 1-10 characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase "B" performed quickly but not simultaneously). You would specify this value as **\x1bB**, which is hexadecimal **(\x)** character 27 (**1B**) followed by a **B**.
Custom Menu	If custom menus have been created (see *Custom User Menus* on page 163), you can assign a default custom menu to the user. The custom menu will display at login. ***Note:*** *In the Local Users table, if the menu assigned to a local user no longer exists, it is marked with an asterisk (*).*
Display Menu at Login	If custom menus have been created, select to enable the menu to display when the user logs into the CLI.
Password/ **Retype Password**	When a user logs into the SLC, the SLC prompts for a password (up to 64 characters). The sysadmin establishes that password here.
Password Expires	If not selected, allows the user to keep a password indefinitely. If selected the user keeps the password for a set period. (See *Local and Remote Users* on page 127 for information on specifying the length of time before the password expires.)

Allow Password Change	Select to allow the user to change password.
Change Password on Next Login	Indicate whether the user must change the password at the next login.
Lock Account	Select to locks the account indefinitely.

3. Assign rights to users. Each user is a member of a group that has a predefined user rights associated with it. You can assign or remove additional rights to the individual user.

Group	Select the group to which the user will belong: **Default Users:** This group has only the most basic rights. You can specify additional rights for the individual user . **Power Users:** This group has the same rights as Default Users plus **Networking**, **Date/Time**, **Reboot & Shutdown**, and **Diagnostics & Reports**. You can specify additional rights for the individual user. **Administrators:** This group has all possible rights.
Full Administrative	Right to perform any function on the SLC.
Networking	Right to enter network and routing settings.
Services	Right to enable and disable system and audit logging, SSH and Telnet logins, SNMP, and SMTP. Includes NFS and CIFS.
SecureLinx Network	Right to view and manage SecureLinx units (e.g., SLPs, Spiders, SLCs) on the local subnet.
Date/Time	Right to set the date and time.
Local Users	Right to add or delete local users on the system.
Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user. Includes configuring remote authentication methods and ordering
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create or edit a custom user menu for the CLI.
Web Access	Right to access Web-Manager.
Reboot & Shutdown	Right to shutdown or reboot the SLC.
Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings).
Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
Device Ports	Right to enter device port settings. Includes creating bidirectional and unidirection connections

PC Card	Right to enter modem settings for PC cards. Includes managing storage PC Cards.

4. Click the **Apply** button.
5. Click the **Back to Local/Remote Users** link to return to the Local/Remote User Settings page.
6. Add another user or click the **Back to Local/Remote Users** link. The Local/Remote Users page displays with the new user(s) listed in the table.

Note: *The logged-in user's name displays at the top of the web page. Only the tabs and options for which the user has rights display.*

Shortcut

To add a user based on an existing user:

1. Display the existing user on the Local/Remote Users Settings page. The fields in the top part of the page display the current values for the user.
2. Change the **Login** to that of the new user. It is best to change the **Password** too.
3. Click the **Apply** button.

To edit a local user:

1. On the Local/Remote Users page, select the user and click the **Add/Edit User** button. The Local/Remote User Settings page displays.
2. Update values as desired.
3. Click the **Apply** button.

To delete a local user:

1. On the Local/Remote Users page, select the user and click the **Add/Edit User** button. The Local/Remote User Settings page displays.
2. Click the **Delete User** button.
3. Click the **Apply** button.

To change the sysadmin password:

1. On the Local/Remote Users page, select **sysadmin** and click the **Add/Edit User** button. The Local/Remote User Settings page displays.
2. Enter the new password in the **Password** and **Retype Password** fields.

   Note: *You can change **Escape Sequence** and **Break Sequence**, if desired. You cannot delete the UID or change the UID, port permissions, or custom menu.*
3. Click the **Apply** button.

Local Users Commands

The following CLI commands correspond to the web page entries described above.

To configure local accounts (including sysadmin) who log in to the SLC by means of SSH, Telnet, the Web, or the console port:

```
set localusers add|edit <User Login> <parameters>
```

Parameters:

```
allowdialback <enable|disable>
breakseq <1-10 Chars>
changenextlogin <enable|disable>
changepassword <enable|disable>
clearports <Port List>
custommenu <Menu Name>
dataports <Port List>
dialbacknumber <Phone Number>
displaymenu <enable|disable>
escapeseq <1-10 Chars>
group <default|power|admin|>
listenports <Port List>
passwordexpires <enable|disable>
permissions <Permission List>
uid <User Identifier>
```

To set whether a complex login password is required:

```
set localusers complexpasswords <enable|disable>
```

To enable or disable authentication of local users:

```
set localusers state <enable|disable>
```

To set a login password for the local user:

```
set localusers password <User Login>
```

To delete a local user:

```
set localusers delete <User Login>
```

To view settings for all users or a local user:

```
show localusers [user <User Login>]
```

To block (lock out) a user's ability to log in:

```
set localusers lock <User Login>
```

Note: *This capability is not available on the web page.*

To allow (unlock) a user's ability to log in:

```
set localusers unlock <User Login>
```

Note: *This capability is not available on the web page.*

Local User Rights Commands

The following CLI commands correspond to the web page entries described above.

To add a local user to a user group or to change the group the user belongs to:

```
set localusers add|edit <user> group <default|power|admin>
```

To set a local user's permissions (not defined by the user group):

```
set localusers add|edit <user> permissions <Permission List>
```

where

`<Permission List>` is one or more of `nt, sv, dt, lu, ra, sk, um, dp, pc, rs, rc, dr, wb, sn, ad`

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To view the rights of the currently logged-in user:

```
show user
```

Remote User Commands

The following CLI commands correspond to the web page entries described above.

To configure whether remote users who are not part of the remote user list will be authenticated:

```
set remoteusers listonlyauth <enable|disable>
```

To configure attributes for users who log in by a remote authentication method:

```
set remoteusers add|edit <User Login> [<parameters>]
```

Parameters

```
breakseq <1-10 Chars>
clearports <Port List>
dataports <Port List>
escapeseq <1-10 Chars>
group <default|power|admin>
listenports <Port List>
permissions <Permissions List>
```

where

`<Permission List>` is one or more of `nt, sv, dt, lu, ra, sk, um, dp, pc, rs, rc, dr, wb, sn, ad`

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To remove a remote user:

```
set remoteusers delete <User Login>
```

To view settings for all remote users:

```
show remoteusers
```

To view the rights of the currently logged-in user:

```
show user
```

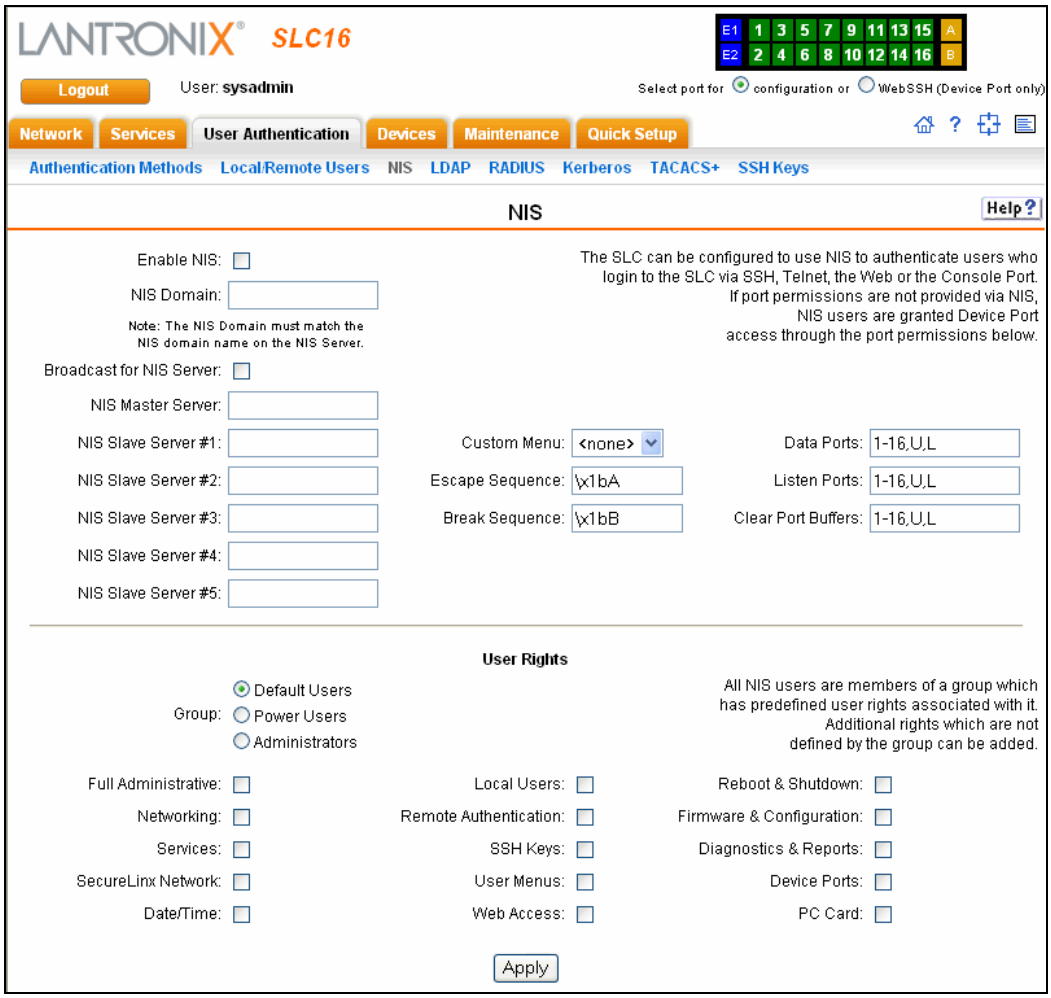
NIS

The system administrator can configure the SLC to use NIS to authenticate users attempting to log in to the SLC through the Web, SSH, Telnet, or the Console port. If NIS does not provide port permissions, you can use this page to grant device port access to users who are authenticated through NIS.

All NIS users are members of a group that has predefined user rights associated with it. You can assign additional user rights that are not defined by the group.

To configure the SLC to use NIS to authenticate users:

1. Click the **User Authentication** tab and select the **NIS** option.



2. Enter the following:

Enable NIS	Displays selected if you enabled this method on the Authentication Methods page. If you want to set up this authentication method but not enable it immediately, clear the checkbox. ***Note:*** *You can enable NIS here or on the first User Authentication page. If you enable NIS here, it automatically displays at the end of the order of precedence on the User Authentication page.*
NIS Domain	The NIS domain of the SLC must be the same as the NIS domain of the NIS server.
Broadcast for NIS Server	If selected, the SLC sends a broadcast datagram to find the NIS Server on the local network.
NIS Master Server (required)	The IP address or host name of the master server.
NIS Slave Servers #1 -5	The IP addresses or host names of up to five slave servers.

Custom Menu	If custom menus have been created (see *Custom User Menus* on page 163), you can assign a default custom menu to NIS users.
Escape Sequence	A single character or a two-character sequence that causes the SLC to leave direct (interactive) mode. (To leave listen mode, press any key.) A suggested value is **Esc+A** (escape key, then uppercase "A" performed quickly but not simultaneously). You would specify this value as **\x1bA**, which is hexadecimal **(\x)** character 27 (**1B**) followed by an **A**. This setting allows the user to terminate the `connect direct` command on the command line interface when the endpoint of the command is `deviceport`, `tcp`, or `udp`.
Break Sequence	A series of 1-10 characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase "B" performed quickly but not simultaneously). You would specify this value as **\x1bB**, which is hexadecimal **(\x)** character 27 (**1B**) followed by a **B**.
Data Ports	The ports users are able to monitor and interact with using the `connect direct` command. **U** and **L** denote the PC Card upper and lower slots.
Listen Ports	The ports users are able to monitor using the `connect listen` command.
Clear Port Buffers	The ports whose port buffer users may clear using the `set locallog clear` command.

3. In the **User Rights** section, select the user group to which NIS users will belong:

Group	Select the group to which the NIS users will belong: **Default Users:** This group has only the most basic rights (described above). **Power Users:** This group has the same rights as Default Users plus **Networking**, **Date/Time**, **Reboot & Shutdown**, and **Diagnostics & Reports**. **Administrators:** This group has all possible rights.

4. Select or clear the checkboxes for the following rights:

Full Administrative	Right to add, update, and delete all editable fields.
Networking	Right to enter Network settings.
Services	Right to enable and disable system logging, SSH and Telnet logins, SNMP, and SMTP.
Date/Time	Right to set the date and time.
SecureLinx Network	Right to view and manage SecureLinx units (e.g., SLPs, Spiders, SLCs) on the local subnet.

Local Users	Right to add or delete local users on the system.
Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user.
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create a custom user menu for the CLI for NIS users.
Reboot & Shutdown	Right to use the CLI or shut down the SLC and then reboot it.
Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings). Selecting this option automatically selects **Reboot & Shutdown**.
Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
SLC Network	Right to view and manage SLCs on the local subnet.
Web Access	Right to access Web-Manager.
Device Ports	Right to enter device port settings.
PC Card	Right to enter modem settings for PC cards.

5. Click the **Apply** button.

Note: *You must reboot the unit before your changes will take effect.*

NIS Commands

These commands for the command line interface correspond to the web page entries described above.

To configure the SLC to use NIS to authenticate users who log in via the Web, SSH, Telnet, or the console port:

`set nis <one or more parameters>`

Parameters:

`breakseq <1-10 Chars>`

`broadcast <enable|`**`disable`**`>`

`clearports <Port List>`

`dataports <Port List>`

`domain <`*`NIS Domain Name`*`>`

`escapeseq <1-10 Chars>`

`listenports <Port List>`

`master <`*`IP Address`* `or` *`Hostname`*`>`

`slave1 <`*`IP Address`* `or` *`Hostname`*`>`

`slave2 <`*`IP Address`* `or` *`Hostname`*`>`

`slave3 <`*`IP Address`* `or` *`Hostname`*`>`

`slave4 <`*`IP Address`* `or` *`Hostname`*`>`

`slave5 <`*`IP Address`* `or` *`Hostname`*`>`

`state <enable|`**`disable`**`>`

To set group and permissions for NIS users:

`set nis group <default|power|admin>`

To set permissions for NIS users not already defined by the user rights group:

`set nis permissions <Permission List>`

where

`<Permission List>` is one or more of `nt, sv, dt, lu, ra, sk, um, dp, pc, rs, rc, dr, wb, sn, ad`

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To set a default custom menu for NIS users:

`set nis custommenu <Menu Name>`

To view NIS settings:

`show nis`

LDAP

The system administrator can configure the SLC to use LDAP to authenticate users attempting to log in using the Web, Telnet, SSH, or the console port.

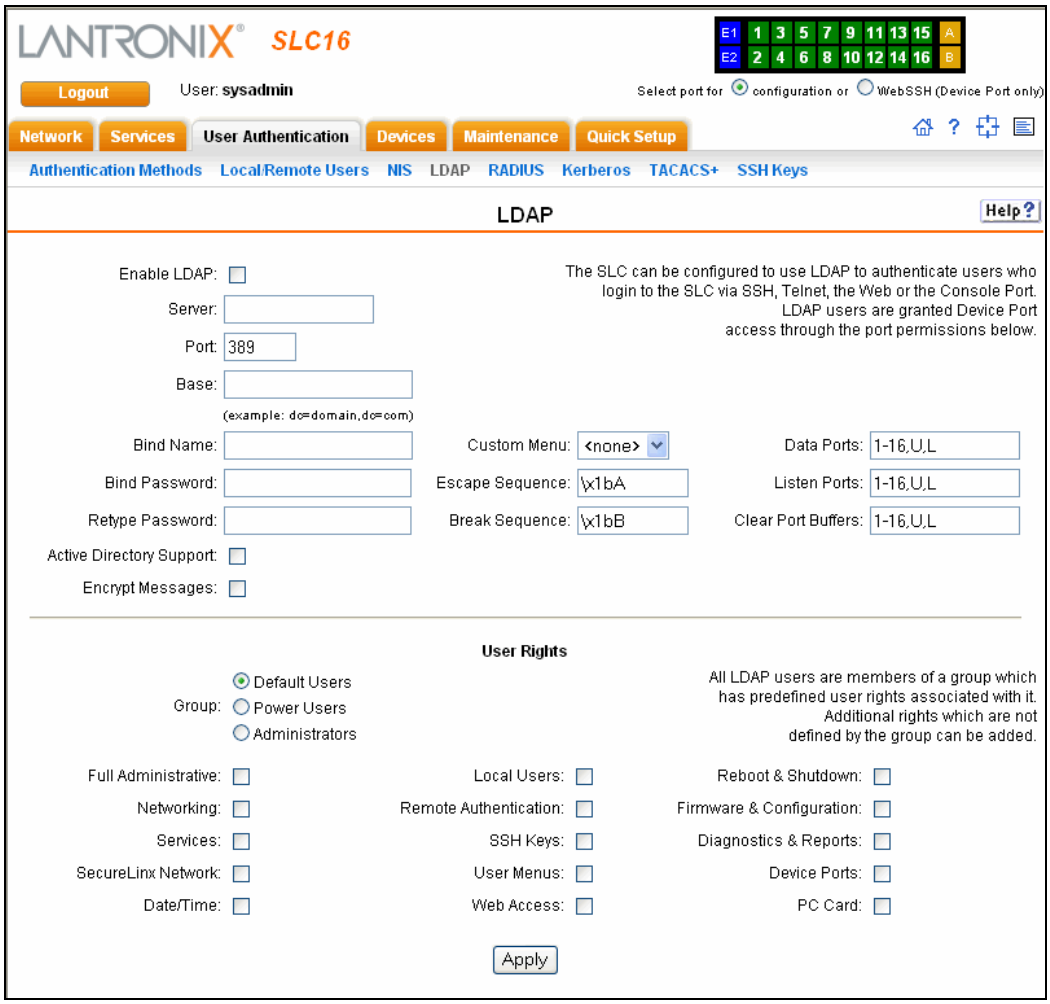
LDAP allows SLC users to authenticate using a wide variety of LDAP servers, such as OpenLDAP and Microsoft Active Directory. The LDAP implementation supports LDAP servers that do not allow anonymous queries.

Users who are authenticated through LDAP are granted device port access through the port permissions on this page.

All LDAP users are members of a group that has predefined user rights associated with it. You can add additional user rights that are not defined by the group.

To configure the SLC to use LDAP to authenticate users:

1. Click the **User Authentication** tab and select **LDAP**. The following page displays.



2. Enter the following:

Enable LDAP	Displays selected if you enabled this method on the first User Authentication page. If you want to set up this authentication method but not enable it immediately, clear the checkbox.
Server	The IP address or host name of the LDAP server.
Port	Number of the TCP port on the LDAP server to which the SLC talks. The default is **389**.
Base	The name of the LDAP search base (e.g., dc=company, dc=com). May have up to 80 characters.

Bind Name	The name for a non-anonymous bind to an LDAP server. This item has the same format as LDAP Base. One example is cn=administrator,cn=Users,dc=domain,dc=com
Bind Password and **Retype Password**	Password for a non-anonymous bind. This entry is optional. Acceptable characters are **a-z**, **A-Z,** and **0-9**. The maximum length is 127 characters.
Active Directory Support	Select to enable. Active Directory is a directory service from Microsoft that is a part of Windows 2000 and later versions of Windows. It is LDAP- and Kerberos- compliant. Disabled by default.
Encrypt Messages	Select to encrypt messages between the SLC and the LDAP server. Disabled by default.
Custom Menu	If custom menus have been created (see *Custom User Menus* on page 163), you can assign a default custom menu to LDAP users.
Escape Sequence	A single character or a two-character sequence that causes the SLC to leave direct (interactive) mode. (To leave listen mode, press any key.) A suggested value is **Esc+A** (escape key, then uppercase "A" performed quickly but not simultaneously). You would specify this value as **\x1bA**, which is hexadecimal **(\x)** character 27 (**1B**) followed by an **A**. This setting allows the user to terminate the `connect direct` command on the command line interface when the endpoint of the command is `deviceport`, `tcp`, or `udp`.
Break Sequence	A series of 1-10 characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase “B” performed quickly but not simultaneously). You would specify this value as **\x1bB**, which is hexadecimal **(\x)** character 27 (**1B**) followed by a **B**.
Data Ports	The ports users are able to monitor and interact with using the `connect direct` command. **U** and **L** denote the PC Card upper and lower slots.
Listen Port	The ports users are able to monitor using the `connect listen` command.
Clear Port Buffers	The ports whose port buffer users may clear using the `set locallog clear` command.

3. In the User Rights section, select the user group to which LDAP users will belong:

Group	Select the group to which the LDAP users will belong: **Default Users:** This group has only the most basic rights (described above). **Power Users:** This group has the same rights as Default Users plus **Networking**, **Date/Time**, **Reboot & Shutdown**, and **Diagnostics & Reports**. **Administrators:** This group has all possible rights.

4. Select or clear the checkboxes for the following rights:

Full Administrative	Right to add, update, and delete all editable fields.
Networking	Right to enter Network settings.
Services	Right to enable and disable system logging, SSH and Telnet logins, SNMP, and SMTP.
SecureLinx Network	Right to view and manage SecureLinx units (e.g., SLPs, Spiders, SLCs) on the local subnet.
Date/Time	Right to set the date and time.
Local Users	Right to add or delete local users on the system.
Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user.
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create a custom user menu for the CLI for LDAP users.
Reboot & Shutdown	Right to use the CLI or shut down the SLC and then reboot it.
Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings). Selecting this option automatically selects **Reboot & Shutdown**.
Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
SLC Network	Right to view and manage SLCs on the local subnet.
Web Access	Right to access Web-Manager.
Device Ports	Right to enter device port settings.
PC Card	Right to enter modem settings for PC cards.

5. Click the **Apply** button.

Note: *You must reboot the unit before your changes will take effect.*

LDAP Commands

These commands for the command line interface correspond to the web page entries described above.

To configure the SLC to use LDAP to authenticate users who log in via the Web, SSH, Telnet, or the console port:

```
set ldap <one or more parameters>
```

Parameters:

```
adsupport <enable|disable>
```
Enables or disables active directory.

```
base <LDAP Base>
bindname <Bind Name>
breakseq <1-10 Chars>
dataports <Ports List>
listenports <Port List>
clearports <Port List>
escapeseq <1-10 Chars>
bindpassword <Bind Password>
encrypt <enable|disable>
port <TCP Port>
```
*Default is **389**.*

```
server <IP Address or Hostname>
state <enable|disable>
```

To set user group and permissions for LDAP users:

```
group <default|power|admin>
```

To set permissions for LDAP users not already defined by the user rights group:

```
permissions <Permission List>
```

where

`<Permission List>` is one or more of `nt, sv, dt, lu, ra, sk, um, dp, pc, rs, rc, dr, wb, sn, ad`

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To set a default custom menu for LDAP users:

```
custommenu <Menu Name>
```

To view LDAP settings:

```
show ldap
```

RADIUS

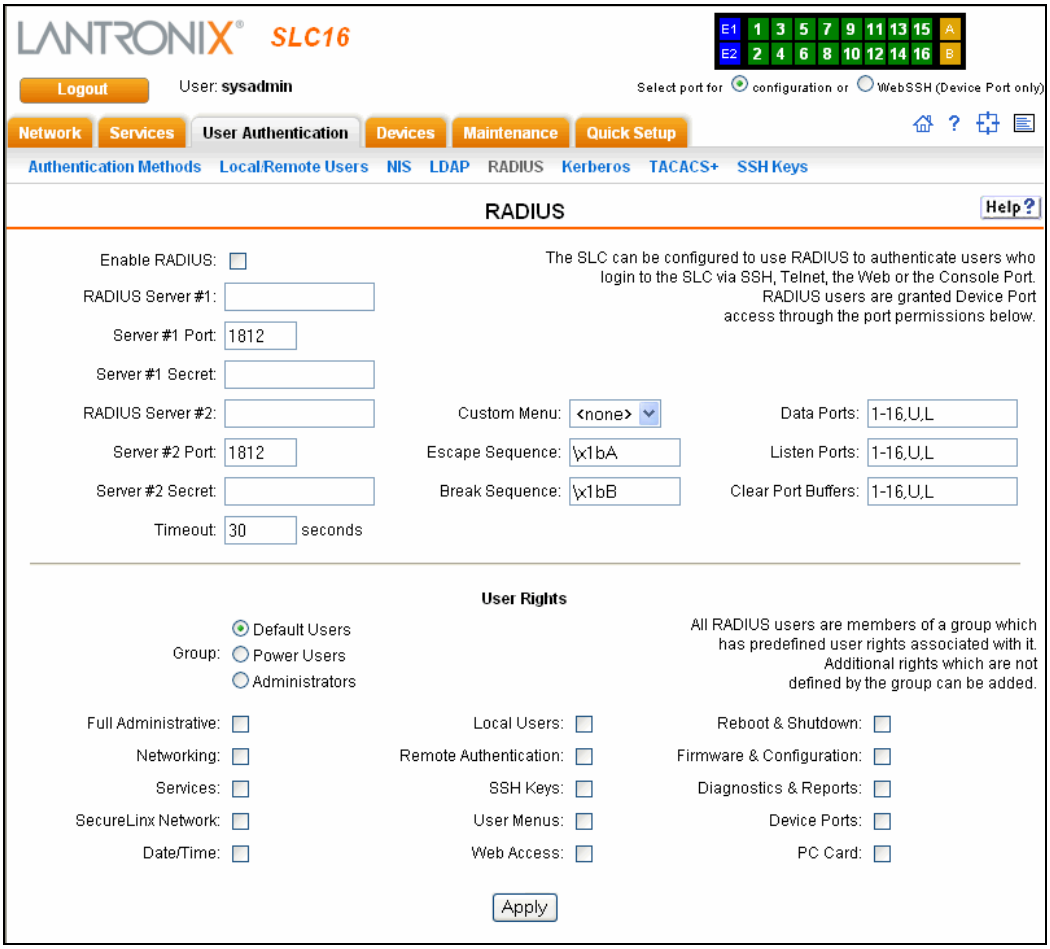
The system administrator can configure the SLC to use RADIUS to authenticate users attempting to log in using the Web, Telnet, SSH, or the console port.

Users who are authenticated through RADIUS are granted device port access through the port permissions on this page.

All RADIUS users are members of a group that has predefined user rights associated with it. You can add additional user rights that are not defined by the group.

To configure the SLC to use RADIUS to authenticate users:

1. Click the **User Authentication** tab and select **RADIUS**. The following page displays.



2. Enter the following:

Enable RADIUS	Displays selected if you enabled this method on the User Authentication page. If you want to set up this authentication method but not enable it immediately, clear the checkbox. ***Note:*** *You can enable RADIUS here or on the first User Authentication page. If you enable RADIUS here, it automatically displays at the end of the order of precedence on the User Authentication page.*

RADIUS Server #1	IP address or hostname of the primary RADIUS server. This RADIUS server may be a proxy for SecurID. SecurID is a two-factor authentication method based on the user's SecurID token and pin number. The SecurID token displays a string of digits called a token code that changes once a minute (some tokens are set to change codes every 30 seconds).
Server #1 Port	Number of the TCP port on the RADIUS server used for the RADIUS service. If you do not specify an optional port, the SLC uses the default RADIUS port (**1812**).
Server #1 Secret	Text that serves as a shared secret between a RADIUS client and the server (SLC). The shared secret is used to encrypt a password sent between the client and the server. May have up to 128 characters.
RADIUS Server #2	IP address or host name of the secondary RADIUS server. This server can be used as a SecurID proxy.
Server #2 Port	Number of the TCP port on the RADIUS server used for the RADIUS service. If you do not specify an optional port, the SLC uses the default RADIUS port (**1812**).
Server #2 Secret	Text that serves as a shared secret between a RADIUS client and the server (SLC). The shared secret is used to encrypt a password sent between the client and the server. May have up to 128 characters.
Timeout	The number of seconds (1-30) after which the connection attempt times out. The default is **30** seconds.
Custom Menu	If custom menus have been created (see *Custom User Menus* on page 163), you can assign a default custom menu to RADIUS users.
Escape Sequence	A single character or a two-character sequence that causes the SLC to leave direct (interactive) mode. (To leave listen mode, press any key.) A suggested value is **Esc+A** (escape key, then uppercase "A" performed quickly but not simultaneously). You would specify this value as **\x1bA**, which is hexadecimal **(\x)** character 27 (**1B**) followed by an **A**. This setting allows the user to terminate the `connect direct` command on the command line interface when the endpoint of the command is `deviceport`, `tcp`, or `udp`.

Break Sequence	A series of 1-10 characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase "B" performed quickly but not simultaneously). You would specify this value as **\x1bB**, which is hexadecimal **(\x)** character 27 (**1B**) followed by a **B**.
Data Ports	The ports users are able to monitor and interact with using the `connect direct` command. **U** and **L** denote the PC Card upper and lower slots.
Listen Port	The ports users are able to monitor using the `connect listen` command.
Clear Port Buffers	The ports whose port buffer users may clear using the `set locallog clear` command.

Note: *Older RADIUS servers may use **1645** as the default port. Check your RADIUS server configuration.*

3. In the **User Rights** section, select the user group to which RADIUS users will belong.

Group	Select the group to which the RADIUS users will belong: **Default Users:** This group has only the most basic rights (described above). **Power Users:** This group has the same rights as Default Users plus **Networking**, **Date/Time**, **Reboot & Shutdown**, and **Diagnostics & Reports**. **Administrators:** This group has all possible rights.

4. Select or clear the checkboxes for the following rights:

Full Administrative	Right to add, update, and delete all editable fields.
Networking	Right to enter Network settings.
Services	Right to enable and disable system logging, SSH and Telnet logins, SNMP, and SMTP.
SecureLinx Network	Right to view and manage SecureLinx units (e.g., SLPs, Spiders, SLCs) on the local subnet.
Date/Time	Right to set the date and time.
Local Users	Right to add or delete local users on the system.
Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user.
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create a custom user menu for the CLI for NIS users.
Reboot & Shutdown	Right to use the CLI or shut down the SLC and then reboot it.

Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings). Selecting this option automatically selects **Reboot & Shutdown**.
Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
SLC Network	Right to view and manage SLCs on the local subnet.
Web Access	Right to access Web-Manager.
Device Ports	Right to enter device port settings.
PC Card	Right to enter modem settings for PC cards.

5. Click the **Apply** button.

Note: *You must reboot the unit before your changes will take effect.*

RADIUS Commands

These commands for the command line interface correspond to the web page entries described above.

To configure the SLC to use RADIUS to authenticate users who log in via the Web, SSH, Telnet, or the console port:

```
set radius <one or more parameters>
```

Parameters:

```
breakseq <1-10 Chars>
clearports <Port List>
dataports <Port List>
escapeseq <1-10 Chars>
listenports <Port List>
state <enable|disable>
```

To identify the RADIUS server(s), the text secret, and the number of the TCP port on the RADIUS server:

```
set radius server <1|2> host <IP Address or Hostname> secret
<Secret> [port <TCP Port>]
```

*The default port is **1812**.*

To set the number of seconds after which the connection attempt times out:

```
set radius timeout <disable|1-30>
```

May be 1-30 seconds.

To set user group and permissions for RADIUS users:

```
set radius group <default|power|admin>
```

To set permissions for RADIUS users not already defined by the user rights group:

`set radius permissions <Permission List>`

where

`<Permission List>` is one or more of `nt, sv, dt, lu, ra, sk, um, dp, pc, rs, rc, dr, wb, sn, ad`

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To set a default custom menu for RADIUS users:

`set radius custommenu <Menu Name>`

To view RADIUS settings:

`show radius`

Kerberos

Kerberos is a network authentication protocol that provides strong authentication for client/server applications by using secret-key cryptography.

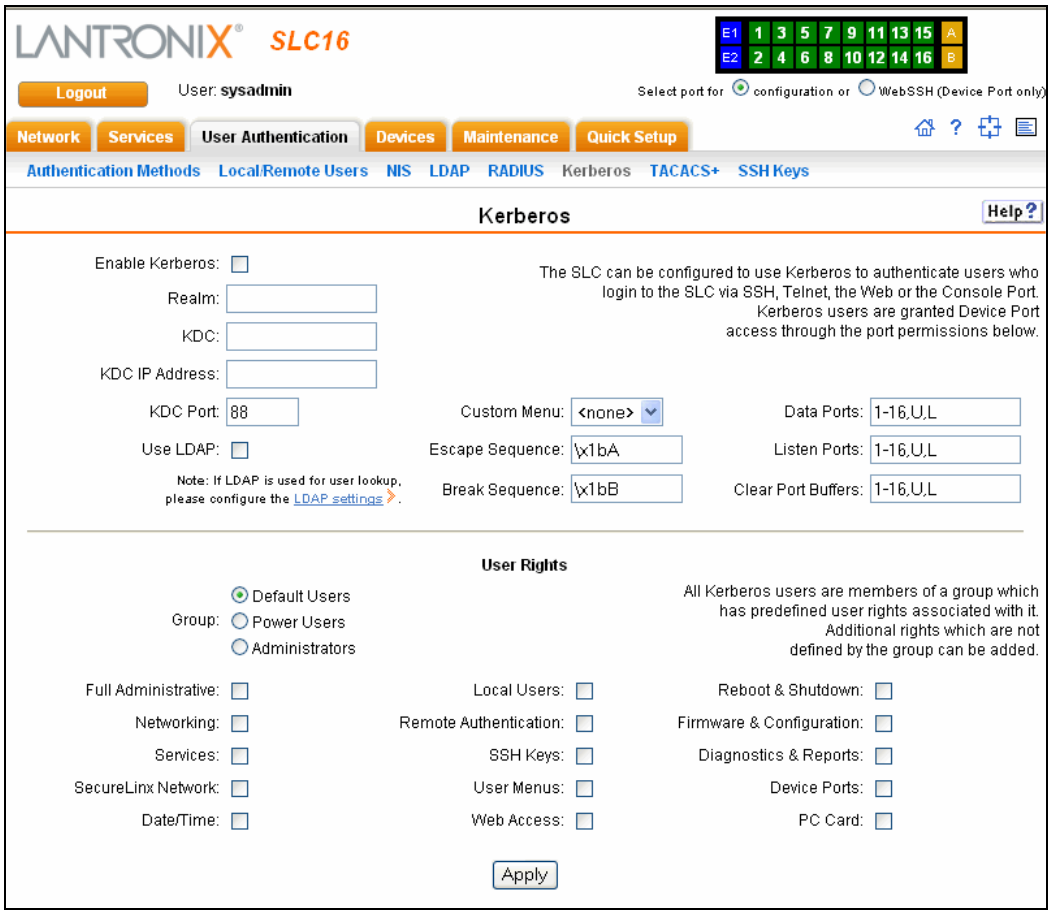
The system administrator can configure the SLC to use Kerberos to authenticate users attempting to log in using the Web, Telnet, SSH, or the console port.

Users who are authenticated through Kerberos are granted device port access through the port permissions on this page.

All Kerberos users are members of a group that has predefined user rights associated with it. You can add additional user rights that are not defined by the group.

To configure the SLC to use Kerberos to authenticate users:

1. Click the **User Authentication** tab and select the **Kerberos** option. The following page displays.



2. Enter the following:

Enable Kerberos	Displays selected if you enabled this method on the User Authentication page. If you want to set up this authentication method but not enable it immediately, clear the checkbox. ***Note:*** *You can enable Kerberos here or on the first User Authentication page. If you enable Kerberos here, it automatically displays at the end of the order of precedence on the User Authentication page.*
Realm	Enter the name of the logical network served by a single Kerberos database and a set of Key Distribution Centers. Usually, realm names are all uppercase letters to differentiate the realm from the Internet domain. Realm is similar in concept to an NT domain.
KDC	A key distribution center (KDC) is a server that issues Kerberos tickets. A ticket is a temporary set of electronic credentials that verify the identity of a client for a particular service. Enter the **KDC** in the fully qualified domain format (FQDN). An example is SLC.local.
KDC IP Address	Enter the IP address of the Key Distribution Center (KDC).

KDC Port	Port on the KDC listening for requests. Enter an integer with a maximum value of 65535. The default is **88**.
Custom Menu	If custom menus have been created (see *Custom User Menus* on page 163), you can assign a default custom menu to RADIUS users.
Escape Sequence	A single character or a two-character sequence that causes the SLC to leave direct (interactive) mode. (To leave listen mode, press any key.) A suggested value is **Esc+A** (escape key, then uppercase "A" performed quickly but not simultaneously). You would specify this value as **\x1bA**, which is hexadecimal **(\x)** character 27 (**1B**) followed by an **A**. This setting allows the user to terminate the `connect direct` command on the command line interface when the endpoint of the command is `deviceport`, `tcp`, or `udp`.
Break Sequence	A series of 1-10 characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase “B” performed quickly but not simultaneously). You would specify this value as **\x1bB**, which is hexadecimal **(\x)** character 27 (**1B**) followed by a **B**.
Use LDAP	Indicate whether Kerberos should rely on LDAP to look up user IDs and Group IDs. This setting is disabled by default. ***Note:*** *Make sure to configure LDAP if you select this option.*
Data Ports	The ports users are able to monitor and interact with using the `connect direct` command. **U** and **L** denote the PC Card upper and lower slots.
Listen Port	The ports users are able to monitor using the `connect listen` command.
Clear Port Buffers	The ports whose port buffer users may clear using the `set locallog clear` command.

3. In the **User Rights** section, select the user group to which Kerberos users will belong.

Group	Select the group to which the Kerberos users will belong: **Default Users:** This group has only the most basic rights (described above). **Power Users:** This group has the same rights as Default Users plus **Networking**, **Date/Time**, **Reboot & Shutdown**, and **Diagnostics & Reports**. **Administrators:** This group has all possible rights.

4. Select or clear the checkboxes for the following rights:

Full Administrative	Right to add, update, and delete all editable fields.

Networking	Right to enter Network settings.
Services	Right to enable and disable system logging, SSH and Telnet logins, SNMP, and SMTP.
SecureLinx Network	Right to view and manage SecureLinx units (e.g., SLPs, Spiders, SLCs) on the local subnet.
Date/Time	Right to set the date and time.
Local Users	Right to add or delete local users on the system.
Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user.
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create a custom user menu for the CLI for Kerberos users.
Reboot & Shutdown	Right to use the CLI or shut down the SLC and then reboot it.
Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings). Selecting this option automatically selects **Reboot & Shutdown**.
Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
SLC Network	Right to view and manage SLCs on the local subnet.
Web Access	Right to access Web-Manager.
Device Ports	Right to enter device port settings.
PC Card	Right to enter modem settings for PC cards.

5. Click the **Apply** button.

Note: *You must reboot the unit before your changes will take effect.*

Kerberos Commands

These commands for the command line interface correspond to the web page entries described above.

To configure the SLC to use Kerberos to authenticate users who log in via the Web, SSH, Telnet, or the console port:

```
set kerberos <one or more parameters>
```

Parameters:

```
breakseq <1-10 Chars>
clearports <Port List>
dataports <Port List>
escapeseq <1-10 Chars>
ipaddr <Key Distribution Center IP Address>
kdc <Key Distribution Center>
listenports <Port List>
port <Key Distribution Center TCP Port>
realm <Kerberos Realm>
state <enable|disable>
useldapforlookup <enable|disable>
```

To set user group and permissions for Kerberos users:

```
set kerberos group <default|power|admin>
```

To set permissions for Kerberos users not already defined by the user rights group:

```
set kerberos permissions <Permission List>
```

where

`<Permission List>` is one or more of `nt, sv, dt, lu, ra, sk, um, dp, pc, rs, rc, dr, wb, sn, ad`

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To set a default custom menu for Kerberos users:

```
set kerberos custommenu <Menu Name>
```

To view Kerberos settings:

```
show kerberos
```

TACACS+

Similar to RADIUS, the main function of TACACS+ is to perform authentication for remote access. The SLC supports the TACACS+ protocol (not the older TACACS or XTACACS protocols).

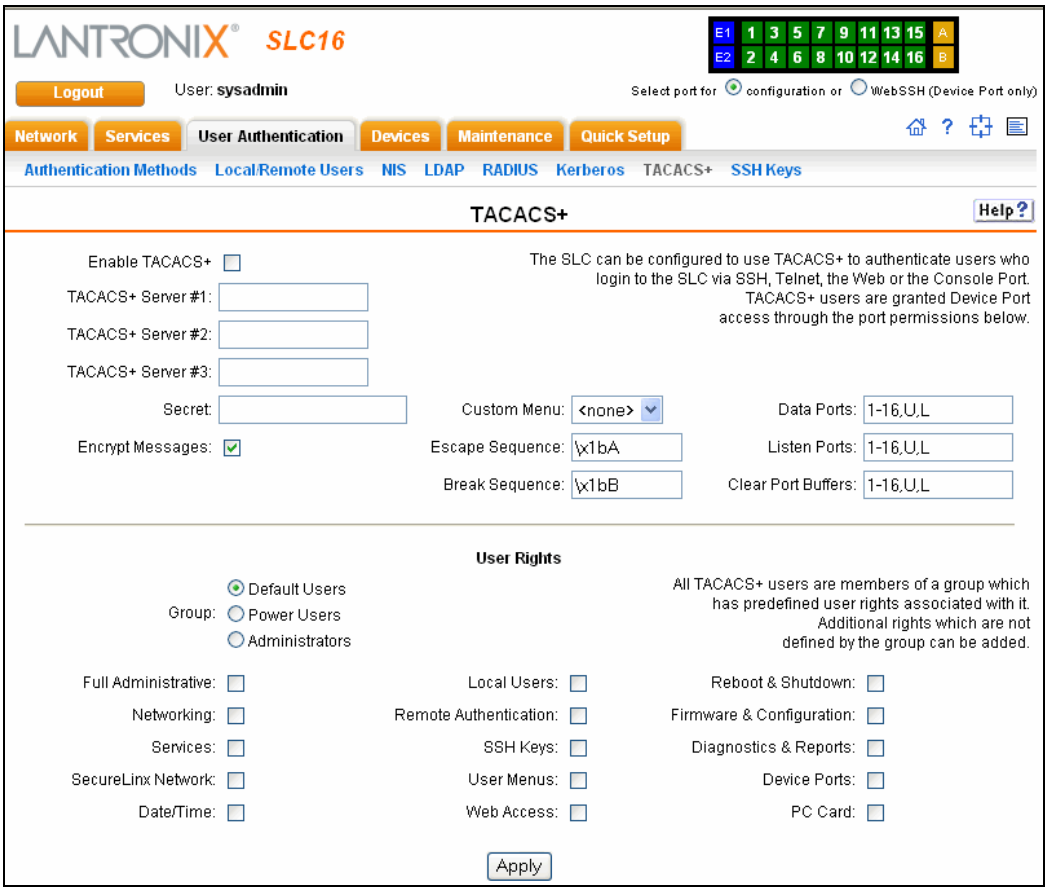
The system administrator can configure the SLC to use TACACS+ to authenticate users attempting to log in using the Web, Telnet, SSH, or the console port.

Users who are authenticated through Kerberos are granted device port access through the port permissions on this page.

All Kerberos users are members of a group that has predefined user rights associated with it. You can add additional user rights that are not defined by the group.

To configure the SLC to use TACACS+ to authenticate users:

1. Click the **TACACS+** tab and select **TACACS+**. The following page displays.



2. Enter the following:

Enable TACACS+	Displays selected if you enabled this method on the User Authentication page. If you want to set up this authentication method but not enable it immediately, clear the checkbox. You can enable TACACS+ here or on the first User Authentication page. If you enable TACACS+ here, it automatically displays at the end of the order of precedence on the User Authentication page.
TACACS+ Servers 1-3	IP address or host name of up to three TACACS+ servers.
Secret	Shared secret for message encryption between the SLC and the TACACS+ server. Enter an alphanumeric secret of up to 127 characters.
Encrypt Messages	Select the checkbox to encrypt messages between the SLC and the TACACS+ server. Selected by default.
Custom Menu	If custom menus have been created (see *the User Guide*), you can assign a default custom menu to TACACS+ users.

Escape Sequence	A single character or a two-character sequence that causes the SLC to leave direct (interactive) mode. (To leave listen mode, press any key.) A suggested value is **Esc+A** (escape key, then uppercase "A" performed quickly but not simultaneously). You would specify this value as **\x1bA**, which is hexadecimal **(\x)** character 27 (**1B**) followed by an **A**. This setting allows the user to terminate the `connect direct` command on the command line interface when the endpoint of the command is `deviceport`, `tcp`, or `udp`.
Break Sequence	A series of 1-10 characters users can enter on the command line interface to send a break signal to the external device. A suggested value is **Esc+B** (escape key, then uppercase "B" performed quickly but not simultaneously). You would specify this value as **\x1bB**, which is hexadecimal **(\x)** character 27 (**1B**) followed by a **B**.
Data Ports	The ports users are able to monitor and interact with using the `connect direct` command. **U** and **L** denote the upper and lower slots of the PC Card.
Listen Port	The ports users are able to monitor using the `connect listen` command.
Clear Port Buffers	The ports whose port buffer users may clear using the `set locallog clear` command.

3. In the **User Rights** section, select the user group to which TACACS+ users will belong.

Group	Select the group to which the TACACS+ users will belong: **Default Users:** This group has only the most basic rights (described above). **Power Users:** This group has the same rights as Default Users plus **Networking**, **Date/Time**, **Reboot & Shutdown**, and **Diagnostics & Reports**. **Administrators:** This group has all possible rights.

4. Select or clear the checkboxes for the following rights:

Full Administrative	Right to add, update, and delete all editable fields.
Networking	Right to enter Network settings.
Services	Right to enable and disable system logging, SSH and Telnet logins, SNMP, and SMTP.
SecureLinx Network	Right to view and manage SecureLinx units (e.g., SLPs, Spiders, SLCs) on the local subnet.
Date/Time	Right to set the date and time.
Local Users	Right to add or delete local users on the system.

Remote Authentication	Right to assign a remote user to a user group and assign a set of rights to the user.
SSH Keys	Right to set SSH keys for authenticating users.
User Menus	Right to create a custom user menu for the CLI for TACACS+ users.
Reboot & Shutdown	Right to use the CLI or shut down the SLC and then reboot it.
Firmware & Configuration	Right to upgrade the firmware on the unit and save or restore a configuration (all settings). Selecting this option automatically selects **Reboot & Shutdown**.
Diagnostics & Reports	Right to obtain diagnostic information and reports about the unit.
SLC Network	Right to view and manage SLCs on the local subnet.
Web Access	Right to access Web-Manager.
Device Ports	Right to enter device port settings.
PC Card	Right to enter modem settings for PC cards.

5. Click the **Apply** button.

Note: *You must reboot the unit before your changes will take effect.*

TACACS+ Commands

These commands for the command line interface correspond to the web page entries described above.

To configure the SLC to use TACACS+ to authenticate users who log in via the Web, SSH, Telnet, or the console port:

```
set tacacs+ <one or more parameters>
```

Parameters:

```
breakseq <1-10 Chars>
clearports <Port List>
dataports <Port List>
encrypt <enable|disable>
escapeseq <1-10 Chars>
listenports <Port List>
secret <TACACS+ Secret>
server1 <IP Address or Name>
server2 <IP Address or Name>
server3 <IP Address or Name>
state <enable|disable>
```

To set user group and permissions for TACACS+ users:

```
set tacacs+ group <default|power|admin>
```

To set permissions for TACACS+ users not already defined by the user rights group:

```
set tacacs+ permissions <Permission List>
```

where

`<Permission List>` is one or more of `nt, sv, dt, lu, ra, sk, um, dp, pc, rs, rc, dr, wb, sn, ad`

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

To set a default custom menu for TACACS+ users:

```
set tacacs+ custommenu <Menu Name>
```

To view TACACS+ settings:

```
show tacacs+
```

SSH Keys

The SLC can import and export SSH keys to facilitate shared key authentication for all incoming and outgoing SSH connections. By using a public/private key pair, a user can access multiple hosts with a single passphrase, or, if a passphrase is not used, a user can access multiple hosts without entering a password. In either case, the authentication is protected against security attacks because both the public key and the private key are required to authenticate. For both imported and exported SSH keys, the SLC supports both RSA and DSA keys, and can import and export keys in OpenSSH and SECSH formats. Imported and exported keys are saved with the SLC configuration, and the administrator has the option of retaining the SSH keys during a reset to factory defaults.

The SLC can also update the SSH RSA1, RSA and DSA host keys that the SSH server uses with site-specific host keys or reset them to the default values.

Imported Keys

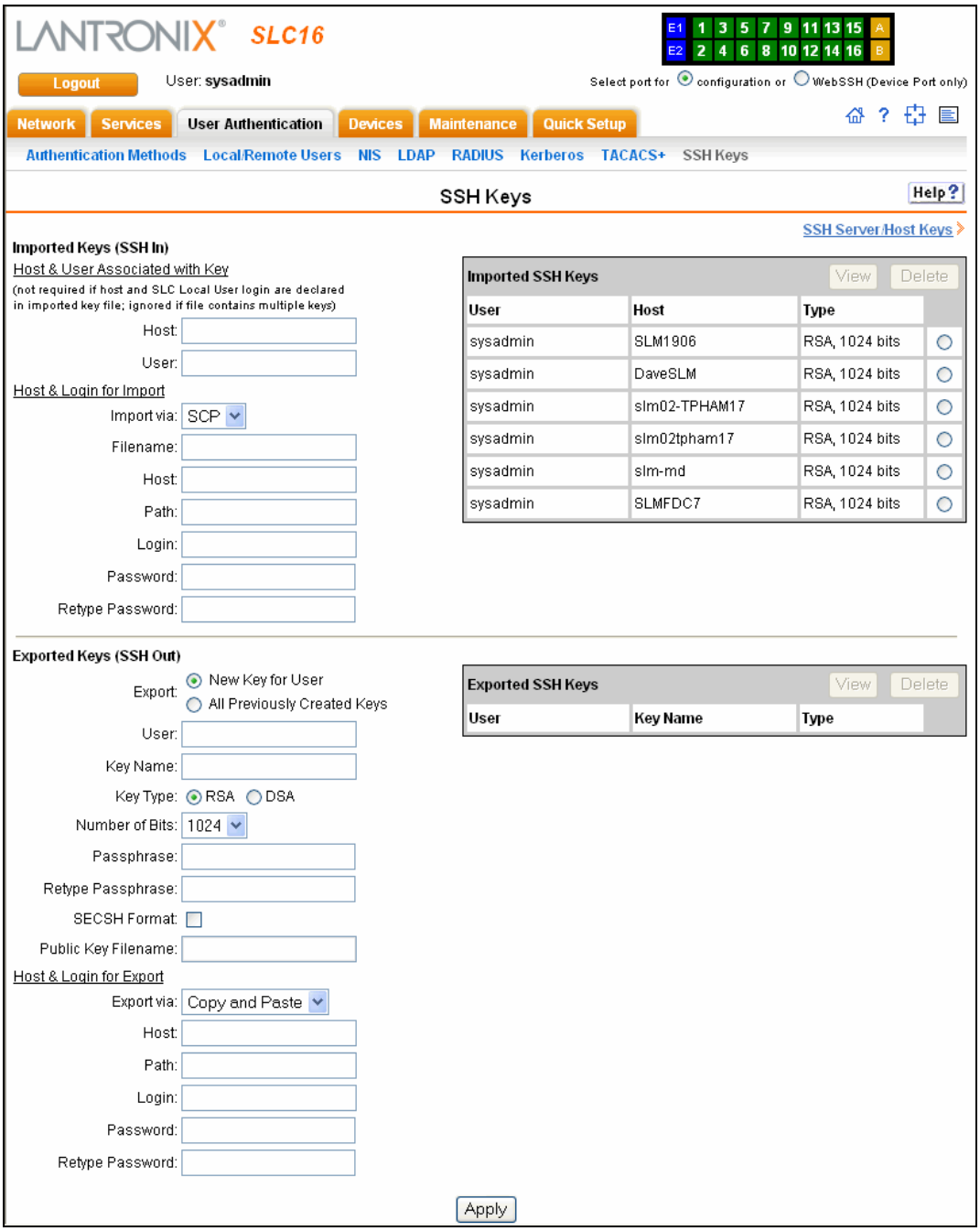
Imported SSH keys must be associated with an SLC local user. The key can be generated on host "MyHost" for user "MyUser," and when the key is imported into the SLC, it must be associated with either "MyUser" (if "MyUser" is an existing SLC local user) or an alternate SLC local user. The public key file can be imported via SCP or FTP; once imported, you can view or delete the public key. Any SSH connection into the SLC from the designated host/user combination uses the SSH key for authentication.

Exported Keys

The SLC can generate SSH keys for SSH connections out of the SLC for any SLC user. The SLC retains both the private and public key on the SLC, and makes the public key available for export via SCP, FTP, or copy and paste. The name of the key is used to generate the name of the public key file that is exported (for example, <keyname>.pub), and the exported keys are organized by user and key name. Once a key is generated and exported, you can delete the key or view the public portion. Any SSH connection out of the SLC for the designated host/user combination uses the SSH key for authentication.

To configure the SLC to use SSH keys to authenticate users:

1. From the main menu, select **User Authentication – SSH Keys**. The following page displays.



2. Enter the following:

Imported Keys (SSH In)

Host & User Associated with Key

These entries are required in the following cases:

- The imported key file does not contain the host that the user will be making an SSH connection from, or

- The SLC local user login for the connection is different from the user name the key was generated from or is not included in the imported key file.

If either of these conditions is true, or the imported file is in SECSH format, you must specify the user and host. The following is an example of a public key file that includes the user and host:

```
ssh-rsa AAAAB3NzaC1yc2EAAAABIwAAAEEApUHCX9EWsHt+jmUGXa1YC3us
ABYxIXUhSU1N+NU9HNaUADUFfd8LYz8/gUnUSH4Ksm8GRT7/8/Sn9jCVfGPh
UQ== asallaway@winserver
```

Host	Host name or IP address from which the SSH connections to the SLC will be made.
User	The User ID of the user being given secure access to the SLC.

Host & Login for Import

Import via	Select **SCP** or **FTP** as the method for importing the SSH keys. **SCP** is the default.
Filename	Name of the public key file (for example, mykey.pub). May contain multiple keys.
Host	IP address of the remote server from which to SCP or FTP the public key file.
Path	Optional pathname to the public key file.
Login	User ID to use to SCP or FTP the file.
Password/Retype Password	Password to use to SCP or FTP the file.

Exported Keys (SSH Out)

Export	Enables you to export created public keys. Select one of the following: **New Key for User:** Enables you to create a new key for a user and export the public key in a file.. **All Previously Created Keys**: Does not create any keys, but exports all previously created public keys in one file.
User	User ID of the person given secure access to the remote server.
Key Name	Name of the key. This will generate the public key filename (e.g., <keyname>.pub).
Key Type	Select either the **RSA** or the **DSA** encryption standard. **RSA** is the default.
Number of Bits	Select the number of bits in the key (**512** or **1024**). The default is **512**.

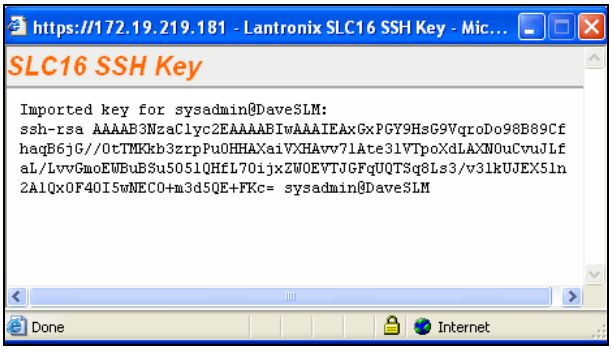
Passphrase/Retype Passphrase	Optionally, enter a passphrase associated with the key. The passphrase may have up to 50 characters. The passphrase is an optional password that can be associated with an SSH key. It is unique to each user and to each key.
SECSH Format	Indicate whether the keys will be exported in **SECSH** format (by default the key is exported in **OpenSSH** format).
Public Key Filename	Filename of the public host key.

Host and Login for Export

Export via	Select the method (**SCP**, **FTP**, or **Cut and Paste)** of exporting the key to the remote server. **Cut and Paste**, the default, requires no other parameters for export.
Host	IP address of the remote server to which the SLC will SCP or FTP the public key file.
Path	Optional path of the file on the host to SCP or FTP the public key too.
Login	User ID to use to SCP or FTP the public key file.
Password/Retype Password	Password to use to SCP or FTP the public key file.

To view or delete a key:

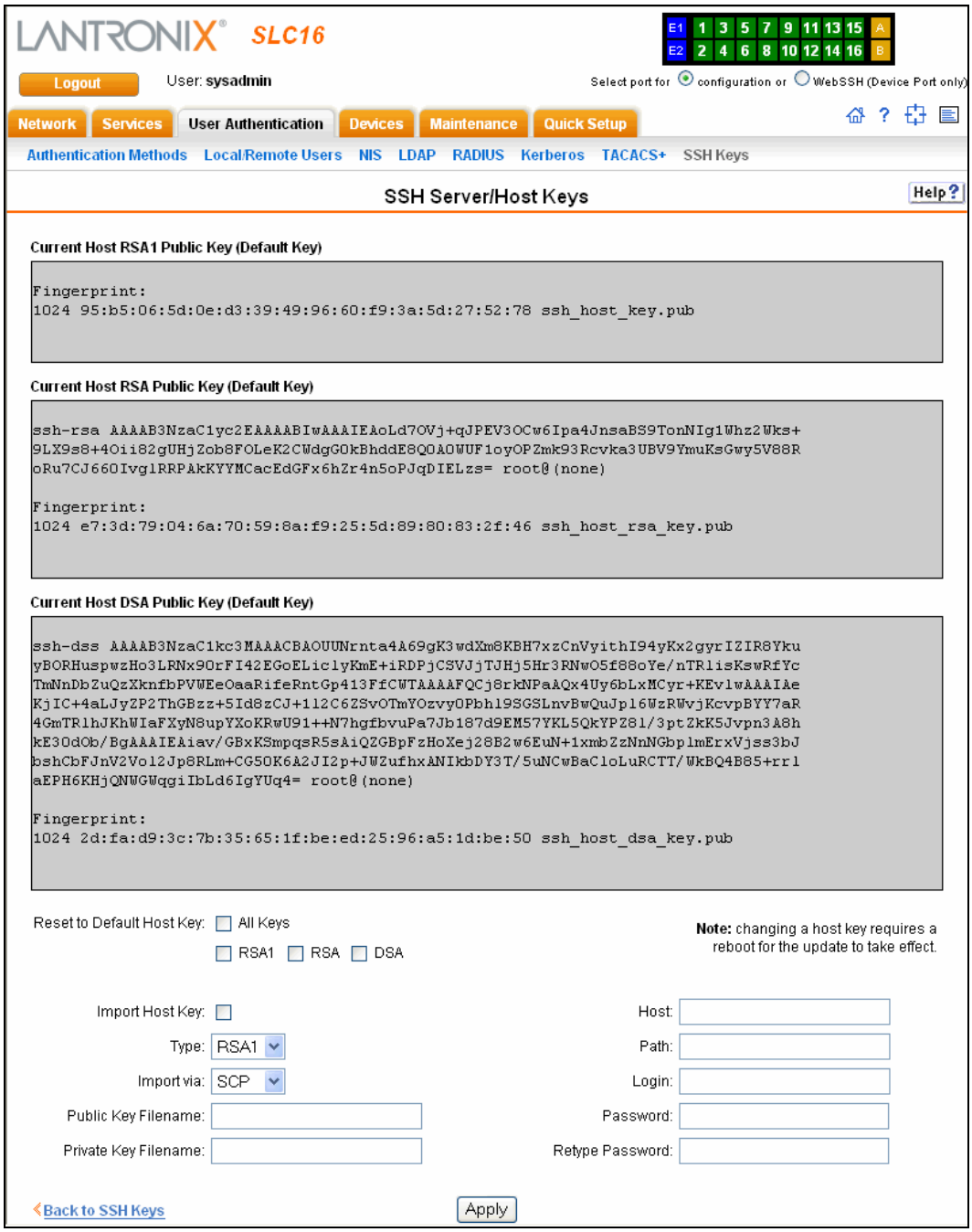
1. Select the key from the appropriate table. The **View** and **Delete** buttons become active.
2. To view the key, click the **View** button. A pop-up page displays the key.



3. To delete the key, click the **Delete** button.

To view, reset, or import SSH RSA1, RSA, And DSA host keys:

1. On the User Authentication – SSH Keys page, click the **SSH Server/Host Keys** link at the top right. The following page displays the current host keys. In the example below, the current keys are the defaults.



2. View or enter the following:

Reset to Default Host Key	Select the **All Keys** checkbox to reset all default key(s), or select one or more checkboxes to reset defaults for **RSA1**, **RSA**, or **DSA** keys. All checkboxes are unselected by default.
Import Host Key	To import a site-specific host key, select the checkbox. Unselected by default.
Type	From the drop-down list, select the type of host key to import.

Import via	From the drop-down list, select the method of importing the host key (SCP or SFTP). The default is **SCP.**
Public Key Filename	Filename of the public host key.
Private Key Filename	Filename of the private host key.
Host	Host name or IPaddress of the host from which to import the key.
Path	Path of the directory where the host key will be stored.
Login	User ID to use to SCP or SFTP the file.
Password & Retype Password	Password to use to SCP or SFTP the file.

3. Click the **Apply** button.
4. Repeat steps 2-3 for each key you want to import.
5. To return to the SSH Keys page, click the **Back to SSH Keys** link.

SSH Commands

These commands for the command line interface correspond to the web page entries described above.

To import an SSH key:

```
set sshkey import <ftp|scp> <one or more parameters>
```

Parameters:

```
[keyhost <SSH Key IP Address or Name>]
[keyuser <SSH Key User>]
[path <Path to Public Key File>]
file <Public Key File>
host <IP Address or Name>
login <User Login>
```

To export a key:

```
set sshkey export <ftp|scp|copypaste> <one or more parameters>
```

Parameters:

```
[format <openssh|secsh>]
[host <IP Address or Name>]
[login <User Login>]
[path <Path to Copy Key>]
bits <512|1024>
keyname <SSH Key Name>
keyuser <SSH Key User>
type <rsa|dsa>
```

To export the public keys of all previously created SSH keys:

```
set sshkey allexport <ftp|scp|copypaste> [pubfile <Public Key
File>] [host <IP Address or Name>] [login <User Login>] [path
<Path to Copy Keys>]
```

To delete a key:

```
set sshkey delete <one or more parameters>
```

Parameters:

```
keyhost <SSH Key Host>
keyname <SSH Key Name>
keyuser <SSH Key User>
```

Note: *Specify the key user and key host to delete an imported key; specify the keyuser and keyname to delete an exported key.*

To import an SLC host key or to reset a SLC host key to the default:

```
set sshkey server import type <rsa1|rsa|dsa> via
<sftp|scp>
pubfile <Public Key File> privfile <Private Key File>
host <IP Address or Name> login <User Login> [path
<Path to Key File>]
```

To reset defaults for all or selected host keys:

```
set sshkey server reset [type <all|rsa1|rsa|dsa>]
```

To display SSH keys that have been imported:

```
show sshkey import <one or more parameters>
```

Parameters:

```
[keyhost <SSH Key IP Address or Name>]
[keyuser <SSH Key User>]
[viewkey <enable|disable>]
```

To display SSH keys that have been exported:

```
show sshkey export <one or more parameters>
```

Parameters:

```
[keyhost <SSH Key IP Address or Name>]
[keyuser <SSH Key User>]
[viewkey <enable|disable>]
```

To display host keys (public key only):

```
show sshkey server [type <all|rsa1|rsa|dsa>]
```

6. Click the **Apply** button. New entries display in the Imported SSH Keys table and Exported SSH Keys table, as applicable.

Custom User Menus

Local and remote users can have a custom user menu as their command line interface rather than the standard command set. Instead of typing each command, the user enters the number associated with the command. Each command can also have a nickname that can display in the menu instead of the command.

From the current menu, a user can display another menu, thus allowing menus to be nested. The special command `showmenu <Menu Name>` displays a specified menu. The special command `returnmenu` redisplays the parent menu if the current menu was displayed from a `showmenu` command.

The user with appropriate rights creates and manages custom user menus from the command line interface, but can assign a custom user menu to a user from either the command line or the web interface.

Custom User Menu Commands

When creating a custom user menu, note the following limitations:

- Maximum of 20 custom user menus
- Maximum of 50 commands per custom user menu (`logout` is always the last command)
- Maximum of 15 characters for menu names
- Maximum of five nested menus can be called.
- No syntax checking (Enter each command correctly.)

To assign a custom user menu to a local or remote user:

```
set localusers add|edit <User Login> menu <Menu Name>
```

To create a new custom user menu or add a command to an existing custom user menu:

```
set menu add <Menu Name> [command <Command Number>]
```

To change a command or nickname within an existing custom user menu:

```
set menu edit <Menu Name> command <Command Number>
set menu edit <Menu Name> nickname <Command Number>
```

To set the optional title for a menu:

```
set menu edit <Menu Name> title <Menu Title>
```

To enable or disable the display of command nicknames instead of commands:

```
set menu edit <Menu Name> shownicknames <enable|disable>
```

To enable or disable the redisplay of the menu before each prompt:

```
set menu edit <Menu Name> redisplaymenu <enable|disable>
```

To delete a custom user menu or one command within a custom user menu:

```
set menu delete <Menu Name> [command <Command Number>]
```

To view a list of all menu names or all commands for a specific menu:

```
show menu <all|Menu Name>
```

Example

The system administrator creates two custom user menus, with menu1 having a nested menu (menu2):

```
[slc]> set menu add menu1
Enter optional menu title (<return> for none): Menu1 Title
Specify nickname for each command? [no] y
Enter each command, up to 50 commands ('logout' is always the last command).
Press <return> when the menu command set is complete.

Command  #1: connect direct deviceport 1
Nickname #1: connect Port-1
Command  #2: connect direct deviceport 2
Nickname #2: connect Port-2
Command  #3: showmenu menu2
Warning: menu 'menu2' does not exist.
Nickname #3: menu2
Command  #4:
Command  #4: logout
Nickname #4: log off
Custom User Menu settings successfully updated.
[slc]> set menu add menu2
Enter optional menu title (<return> for none): Menu2 Title
Specify nickname for each command? [no]
Enter each command, up to 50 commands ('logout' is always the last command).
Press <return> when the menu command set is complete.

Command  #1: connect direct deviceport 3
Command  #2: connect direct deviceport 4
Command  #3: show datetime
Command  #4: returnmenu
Command  #5:
Command  #5: logout
Custom User Menu settings successfully updated.
[slc]> show menu all
___Custom User Menus_____________________________________________________________
menu1             menu2
[slc]> show menu menu1
___Custom User Menus_____________________________________________________________
Menu: menu1
Title: Menu1 Title
Show Nicknames: enabled
Redisplay Menu: disabled
Command   1: connect direct deviceport 1
Nickname  1: connect Port-1
Command   2: connect direct deviceport 2
Nickname  2: connect Port-2
Command   3: showmenu menu2
Nickname  3: menu2
Command   4: logout
Nickname  4: log off
[slc]> show menu menu2
_
```

```
__Custom User Menus_____________________________________________________________
Menu: menu2
Title: Menu2 Title
Show Nicknames: disabled
Redisplay Menu: disabled
Command   1: connect direct deviceport 3
Nickname  1: <none>
Command   2: connect direct deviceport 4
Nickname  2: <none>
Command   3: show datetime
Nickname  3: <none>
Command   4: returnmenu
Nickname  4: <none>
Command   5: logout
Nickname  5: <none>
```

The system administrator 4 configures local user 'john' to use custom menu 'menu1':

```
[slc]> set localusers edit john custommenu menu1
Local users settings successfully updated.
[slc]> show localusers user john
___Current Local Users Settings_________________________________________________
Login: john
    Password: <set>  UID: 101
    Listen Ports: 1-32
    Data Ports: 1-32
    Clear Ports: 1-32
    Escape Sequence: \x1bA  Break Sequence: \x1bB
    Custom Menu: menu1
    Allow Dialback: disabled
    Dialback Number: <none>
```

User 'john ' logs into the command line interface, initially sees menu1, executes the command to jump to nested menu menu2, and then returns to menu1:

```
Welcome to the SecureLinx Console Manager
Model Number: SLC32
For a list of commands, type 'help'.

[Enter 1-4]> help
                                Menu1 Title
------------------------------------------------------------------------
 1) connect Port-1                    3) menu2
 2) connect Port-2                    4) log off
[Enter 1-4]> 3
Executing: showmenu menu2

[Enter 1-5]> help
Menu2 Title
-----------
 1) connect direct deviceport 3
 2) connect direct deviceport 4
 3) show datetime
 4) returnmenu
 5) logout
[Enter 1-5]> 3
Executing: show datetime
Date/Time: Tue Sep  7 19:13:35 2004
Timezone: UTC
[Enter 1-5]> 4
Executing: returnmenu

[Enter 1-4]> help
```

```
                              Menu1 Title
------------------------------------------------------------------------------
 1) connect Port-1                   3) menu2
 2) connect Port-2                   4) log off
[Enter 1-4]> 4
Executing: logout
Logging out...
```

12: Maintenance

The system administrator performs maintenance activities and operates the SLC using the pages of the **Maintenance** tab and additional commands on the command line interface.

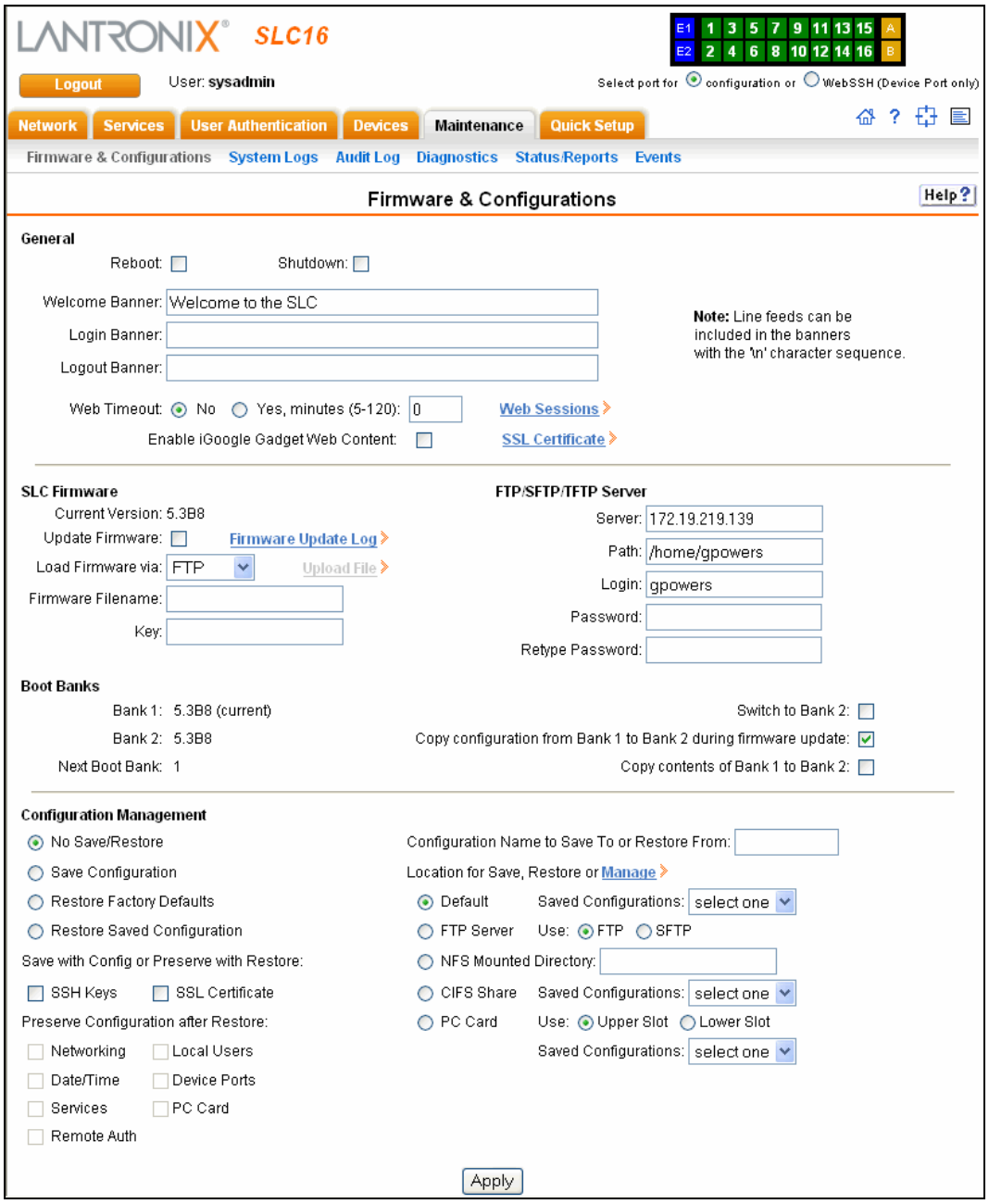
Firmware & Configurations

The SLC Firmware & Configurations page allows the system administrator to:

- Configure the FTP, SFTP, or TFTP server that will be used to provide firmware updates and save/restore configurations. (TFTP is only used for firmware updates.)
- Set up the location or method that will be used to save or restore configurations (default, FTP, SFTP, NFS, CIFS, or PC Card). Update the version of the firmware running on the SLC.
- Save a snapshot of all settings on the SLC (save a configuration).
- Restore the configuration, either to a previously saved configuration, or to the factory defaults.
- View and terminate current web sessions.
- Import a site-specific SSL certificate
- For dual boot SLCs, view the firmware version on each boot bank, select the bank to boot from, and copy the contents of one boot bank to the other.
- Enable an iGoogle gadget that displays the status of ports on multiple SLCs.

To configure settings:

1. Click the **Maintenance** tab. The Firmware & Configurations page displays.



2. Enter the following:

General

Reboot	Select this option to reboot the SLC immediately. The default is **No**. ***Note:*** *The front panel LCD displays the "Rebooting the SLC" message, and the normal boot sequence occurs.*
Shutdown	Select this option to shut down the SLC. The default is **No**.

Welcome Banner	The text to display on the command line interface before the user logs in. **Welcome to the SLC** is the default. ***Note:*** *To create more lines use the* ***\n*** *character sequence.*
Login Banner	The text to display on the command line interface after the user logs in. May contain up to 1024 characters. Default is blank. ***Note:*** *To create more lines, use the* ***\n*** *character sequence.*
Logout Banner	The text to display on the command line interface after the user logs out. May contain up to 1024 characters. Default is blank. ***Note:*** *To create more lines use, the* ***\n*** *character sequence.*
Web Timeout	Number of minutes (5-120) after which the SLC web session times out. The default is **5**. To avoid timeouts, select **No**. If the session times out, refresh the browser page and enter your user id and password to open another web session. ***Note:*** *If you close the browser without logging off the SLC first, you will have to wait for the timeout time to expire. You can also end a web session by using the* `admin web terminate` *command at the CLI or by asking your system administrator to terminate your active web session.* To view or terminate current web sessions, click the **Web Sessions** link. (See **Firmware & Configurations – Web Sessions** on page *173.)* To view, import, or reset the SSL Certificate, click the **SSL Certificate** link. *(*See *Firmware & Configurations – SSL* Certificate on page 173*.)*
Enable iGoogle Gadget Web Content	Select the check box to enable an SLC iGoogle gadget. The iGoogle gadget allows an iGoogle user to view the port status of many SLCs on one web page. (See *iGoogle Gadgets* on page 176.)

SLC Firmware

Update Firmware	To update the SLC firmware, select the checkbox. If you select this option, the SLC reboots after you apply the update. To view a log of all prior firmware updates, click the **Firmware Update Log** link. ***Note:*** *For dual boot SLCs, the non-active boot bank is updated during the firmware update, without requiring a reboot. The configuration on the current boot bank may optionally be copied to the non-active boot bank during the firmware update.*

Load Firmware via	From the drop-down list, select the method of loading the firmware. Options are **FTP**, **TFTP, HTTPS** and **SFTP (Secure FTP)**. **FTP** is the default. If you select **HTTPS**, the **Upload File** link becomes active. Select the link to open a popup window that allows you to browse to a firmware update file to upload.
Firmware Filename	The name of the firmware update file downloaded from the Lantronix web site.
Key	A key for validating the firmware file. The key is provided with the firmware file (32 hex characters).

Boot Banks

Bank 1	Version of SLC firmware in bank 1. **Note:** The word "current" displays next to the bank the SLC booted from.
Bank 2	Version of SLC firmware in bank 2.
Next Boot Bank	Current setting for bank to boot from at next reboot.
Switch to Bank	If desired, select the alternate bank to boot from at next reboot.
Copy configuration from Bank 1 to Bank 2 during firmware update	If checked, will copy the configuration from the current bank to the bank being updated.
Copy contents of Bank 1 to Bank 2	If checked, enables you to copy the current boot bank to the alternate boot bank. This process takes a few minutes to complete.

FTP/TFTP/SFTP

Server	The IP address or host name of the server used for obtaining updates and saving or restoring configurations. May have up to 64 alphanumeric characters; may include hyphens and underscores.
Path	The default path on the server for obtaining firmware update files and getting and putting configuration save files.
Login	The userid for accessing the FTP server. May be blank.
Password & Retype Password	The FTP user password.

Configuration Management

Configuration Management	From the option list, select one of the following: **No Save/Restore:** Does not save or restore a configuration. **Save Configuration:** Saves all settings to file, which can be backed up to a location that is not on the SLC. **Restore Factory Defaults:** Restores factory defaults. If you select this option, the SLC reboots after you apply the update. Select the **Save SSH Keys** checkbox to save any imported or exported SSH keys. Select the **Save SSL Certificate** checkbox to save any imported certificate. Disabled by default. **Restore Saved Configuration:** Returns the SLC settings to a previously saved configuration. If you select this option, the SLC reboots after you apply the update.
Configuration Name to Save To or Restore From	If you selected to save or restore a configuration, enter a name for the configuration file (up to 12 characters).
Location for Save, Restore, or Manage	If you selected to save or restore a configuration, select one of the following options: **Default – Saved Configurations:** If restoring, select a saved configuration from the drop-down list. **FTP Server:** The FTP server specified in the FTP/SFTP/TFTP section. If you select this option, select FTP or SFTP to transfer the configuration file. **NFS Mounted Directory:** Local directory of the NFS server for mounting files. **CIFS Share – Saved Configurations:** If restoring, select a saved configuration from the drop-down list. **PC Card:** If a PC Card Compact Flash is loaded into one of the PC Card slots on the front of the SLC, and properly mounted (see *9: PC Cards*), the configuration can be saved to or restored from this location. If you select this option, select the slot (upper or lower) in which the PC Card Compact Flash is mounted, and then select a saved configuration from the drop-down list. **Manage:** The **Manage** option allows you to view and delete all configurations saved to the selected location. This feature is available for the default, CIFS Share, and PC Card locations. (See next procedure).

Preserve Configuration after Restore	Allows the user to keep a subset of the current configuration after restoring a configuration or resetting to factory defaults. Select the checkbox for each part of the current configuration you want to keep, for example, Networking, Services, or Device Ports.

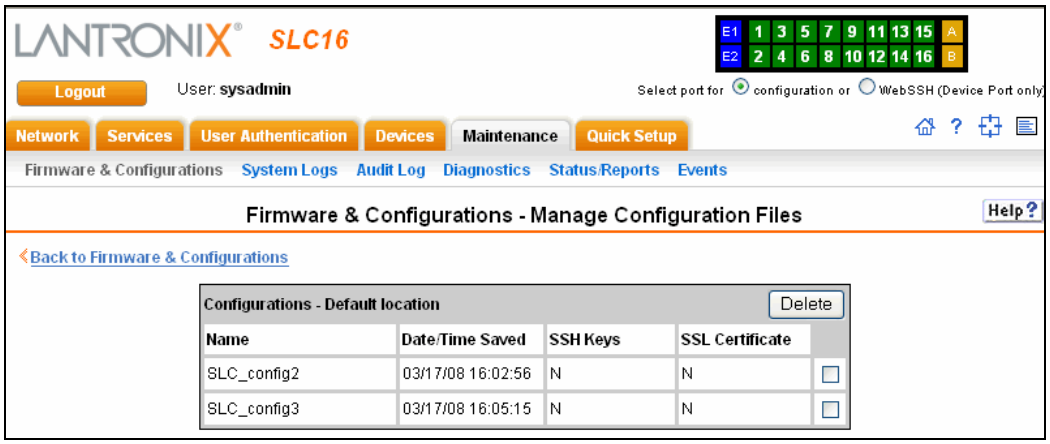
3. Click the **Apply** button.

Note: *If you selected an option that forces a reboot (restore configuration, update firmware, or reset factory defaults), the SLC automatically reboots at the end of the process.*

To manage configuration files:

The **Manage** option on the Firmware & Configurations page allows you to view all configurations saved to the selected location and delete any of the configurations. This feature is available for the default, CIFS Share, and PC Card locations.

1. On the Firmware and Configurations page, click the **Manage** link. The following page displays the name and the time and date the file was saved:



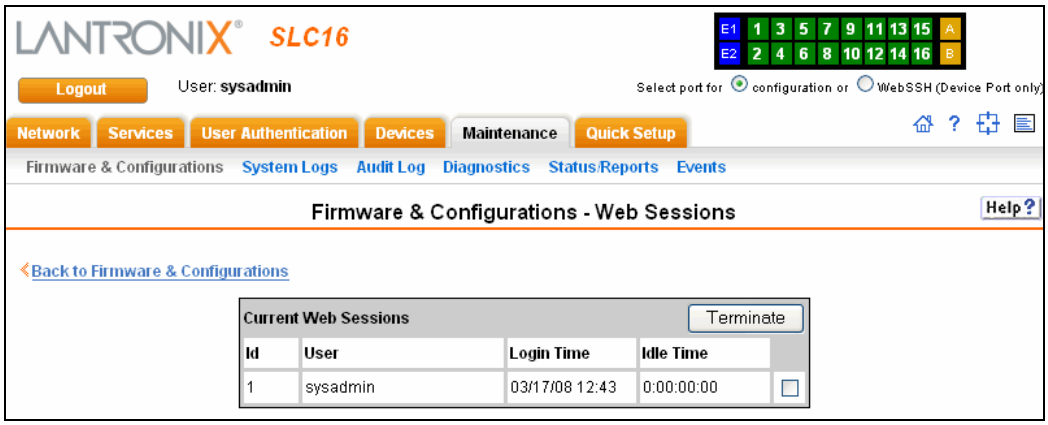
2. To delete files, select one or more files and click the **Delete** button.

Firmware & Configurations – Web Sessions

The Firmware & Configurations - Web Sessions page enables you to view and terminate current web sessions.

To view or terminate current web sessions:

1. On the Firmware & Configurations page, click the **Web Sessions** link. The following page displays:



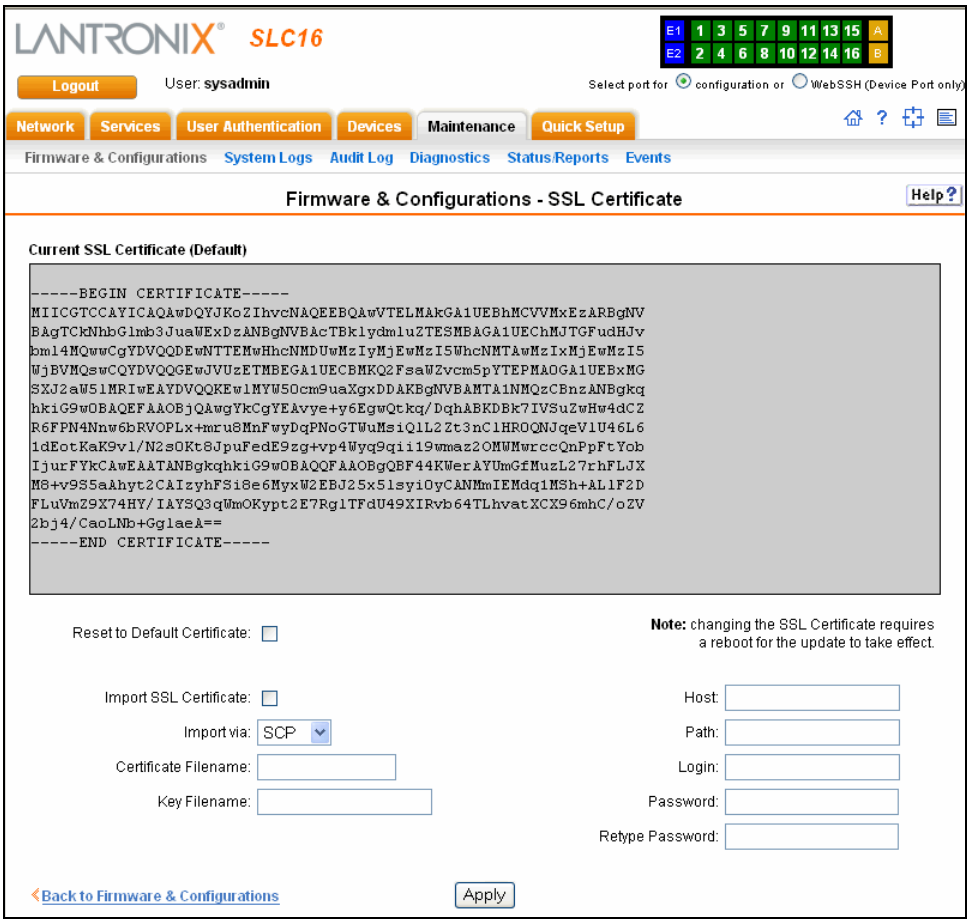
2. To terminate a web session, select the checkbox for the session and click the **Terminate** button.
3. To return to the Firmware & Configurations page, click the **Back to Firmware & Configurations** link.

Firmware & Configurations – SSL Certificate

The SLC Firmware & Configurations – SSL Certificate page enables you to view and update SSL certificate information. The SSL certificate, consisting of a public/private key pair used to encrypt HTTP data, is associated with the web server. You can import a site-specific SSL certificate, if desired.

To view, reset, import, or change an SSL Certificate:

1. On the Firmware & Configurations page, click the **SSL Certificate** link. The following page displays the current SSL certificate.



2. If desired, enter the following:

Reset to Default Certificate	To reset to the default certificate, select the checkbox to reset to the default certificate. Unselected by default.
Import SSL Certificate	To import your own SSL Certificate, select the checkbox. Unselected by default.
Import via	From the drop-down list, select the method of importing the certificate (SCP or SFTP). The default is **SCP.**
Certificate Filename	Filename of the certificate.
Key Filename	Filename of the private key for the certificate.
Host	Host name or IPaddress of the host from which to import the file.
Path	Path of the directory where the certificate will be stored.
Login	User ID to use to SCP or SFTP the file.
Password and **Retype Password**	Password to use to SCP or SFTP the file.

3. Click the **Apply** button.

   Note: *You must reboot the SLC for the update to take effect.*

4. To return to the Back to Firmware & Configurations page, click the link at the bottom of the page.

iGoogle Gadgets

You can create an iGoogle gadgets that enables you to view the status of the ports of many SLCs on one web page.

Anyone with a Google email account (gmail.com) can create an iGoogle gadget for viewing web pages. There are two types of iGoogle gadgets: public gadgets and private gadgets. When a gadget's XML code is submitted to Google, it becomes part of the iGoogle public gadgets, which are listed for import on iGoogle web pages. When a gadget's XML code is stored on a private server, the gadget stays private and is usable only by users who are aware of its location.

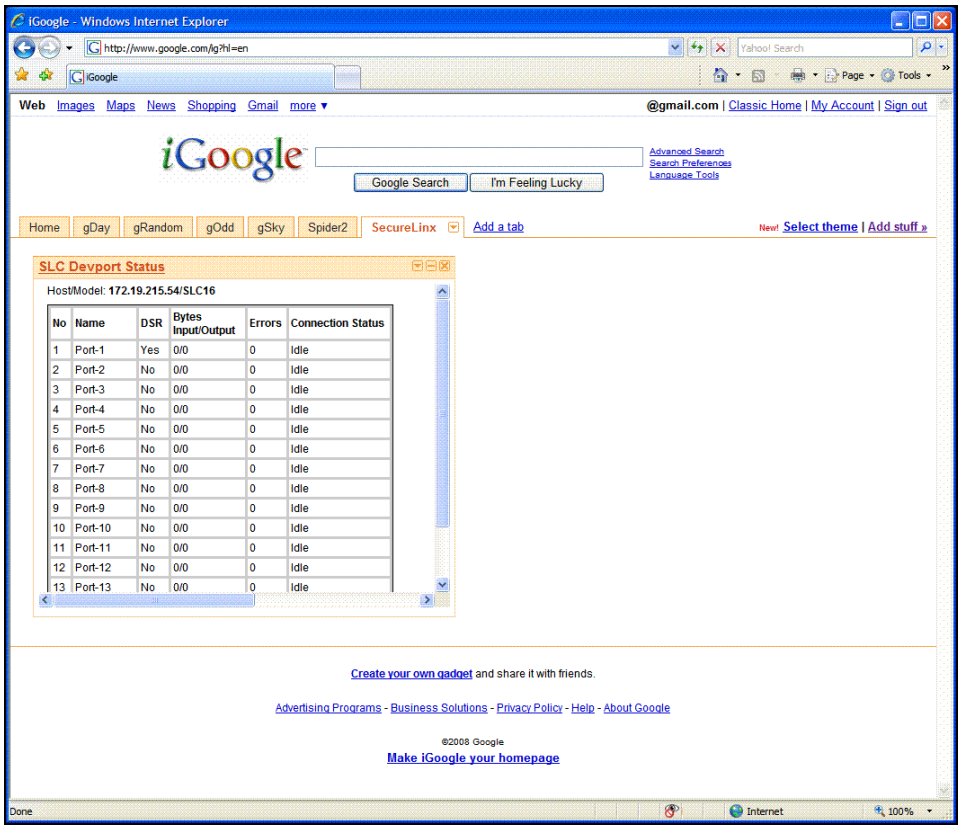
To set up an SLC iGoogle gadget:

1. Load the following XML code on a web server that is accessible over the Internet. This code describes how to retrieve information and how to format the data for display.

```
<?xml version="1.0" encoding="UTF-8" ?>
- <Module>
<ModulePrefs title="__UP_model__ Devport Status"
  title_url="http://www.lantronix.com"
  directory_title="SLC/SLB Status" description="Devport
  status and counters" scrolling="true" width="400"
  height="360" />
- <UserPref name="model" display_name="Model" datatype="enum"
  default_value="slc">
<EnumValue value="SLC" display_value="SLC" />
<EnumValue value="SLB" display_value="SLB" />
  </UserPref>
<UserPref name="ip" display_name="IP Address" required="true"
  />
- <UserPref name="rate" display_name="Refresh Rate"
  datatype="enum" default_value="10">
<EnumValue value="1" display_value="1 second" />
<EnumValue value="5" display_value="5 seconds" />
<EnumValue value="10" display_value="10 seconds" />
<EnumValue value="30" display_value="30 seconds" />
<EnumValue value="60" display_value="1 minute" />
<EnumValue value="300" display_value="5 minutes" />
<EnumValue value="600" display_value="10 minutes" />
  </UserPref>
<Content type="url" href="http://__UP_ip__/devstatus.htm" />
  </Module>
```

2. On the iGoogle web page, click the **Add stuff** link.
3. On the new page, click the **Add feed or gadget** link.
4. In the field that displays, type the URL of the gadget location.
5. Return to the gadget viewing page and complete the SLC gadget configuration fields.

You should see an iGoogle gadget similar to the following:



Administrative Commands

These commands for the command line interface correspond to the web page entries described above.

To reboot the SLC:

```
admin reboot
```

Note: *The front panel LCD displays the "Rebooting the SLC" message, and the normal boot sequence occurs.*

To add welcome, login, and logout banners:

```
admin banner login <Banner Text>
admin banner logout <Banner Text)
admin banner welcome <Banner Text>
```

Note: *To go to the next line, type* ***\n*** *and press* ***Enter****.*

To display banners:

```
admin banner show
```

To prepare the SLC to be powered off:

```
admin shutdown
```

Note: *When you use this command to shut down the SLC, the LCD front panel displays "Shutting down the SLC," followed by a pause, and then "Shutdown complete." When "Shutdown complete" displays, it is safe to power off the SLC. This command is not available on the Web page.*

To configure the timeout for web sessions:

```
admin web timeout <disable|5-120>
```

Timeouts are measured in minutes.

To terminate a web session:

```
admin web terminate <web session id>
```

To view current timeout and all active web sessions:

```
admin web show
```

To list current hardware and firmware information:

```
admin version
```

To update SLC firmware to a new revision:

Note: *The firmware file should be accessible via the settings displayed by* `admin ftp show`*. The SLC automatically reboots after successful update.*

```
admin firmware update <ftp|tftp|sftp> file <Firmware File> key
<Checksum Key>
```

To copy the boot bank from the currently booted bank to the alternate bank (for dual-boot SLCs):

```
admin firmware copybank
```

To set the boot bank to be used at the next SLC reboot:

```
admin firmware bootbank <1|2>
```

Applies to dual-boot SLCs only.

To list the current firmware revision:

```
admin firmware show [viewlog <enable|disable>]
```

Lists the current firmware revision, the boot bank status (for dual-boot SLCs), and optionally displays the log containing details about firmware updates.

To lock or unlock the LCD keypad:

Note: *If the keypad is locked, users can scroll through settings but not change them.*

```
admin keypad <lock|unlock>
```

To change the Restore Factory Defaults password used at the LCD to return the SLC to the factory settings:

```
admin keypad password <Password>
```
Must be 6 digits.

To view keypad settings:

```
admin keypad show
```

To set the FTP/TFTP/SFTP server used for firmware updates and configuration save/restore:

```
admin ftp server <IP Address or Hostname> [login <User Login>]
[path <Directory>]
```

To view FTP settings:

```
admin ftp show
```

To set the FTP server password and prevent it from being echoed:

```
admin ftp password
```

To restore the SLC to factory default settings:

```
admin config factorydefaults [savesshkeys <enable|disable>]
[savesslcert <enable|disable>][preserveconfig <Config Params to
Preserve>]
```

`<Config Params to Preserve>` is a comma-separated list of current configuration parameters to retain after the config restore or factorydefaults:

`nt` – Networking	`lu` - Local Users
`sv` – Services	`dp` - Device Ports
`dt` - Date/Time	`pc` - PC Card

To restore a saved configuration to the SLC:

```
admin config restore <Config Name> location
<default|ftp|sftp|nfs|cifs|pccard> [nfsdir <NFS Mounted Dir>]
[pccardslot <upper|lower>] [keepconfig <Config Params to Keep>]
[preserveconfig <Config Params to Prserve>]
```

`<Config Params to Preserve>` is a comma-separated list of current configuration parameters to retain after the config restore or factorydefaults:

`nt` – Networking	`lu` - Local Users
`sv` – Services	`dp` - Device Ports
`dt` - Date/Time	`pc` - PC Card
ra – remote authentication	

To save the current SLC configuration to a selected location:

```
admin config save <Config Name> location
<default|ftp|sftp|nfs|cifs|pccard> [nfsdir <NFS Mounted Dir>]
[pccardslot <upper|lower>]
```

To list the configurations saved to a location:

```
admin config show <default|ftp|sftp|nfs|cifs|pccard> [nfsdir <NFS
Mounted Dir>] [pccardslot <upper|lower>]
```

To run the quick setup script:

```
admin quicksetup
```

To import an SSL certificate, or reset the web server certificate to the default:

```
admin web certificate import via <sftp|scp> certfile <Certificate File>
          privfile <Private Key File> host <IP Address or Name>
          login <User Login> [path <Path to Files>]
```

To reset a web certificate:

```
admin web certificate reset
```

To show a web certificate:

```
admin web certificate show
```

To enable or disable iGoogle Gadget web content:

```
admin web gadget <enable|disable>
```

System Logs

The System Logs page allows you to *view* various system logs. (See *7: Services* for more information about system logs.) You can also clear logs on this page.

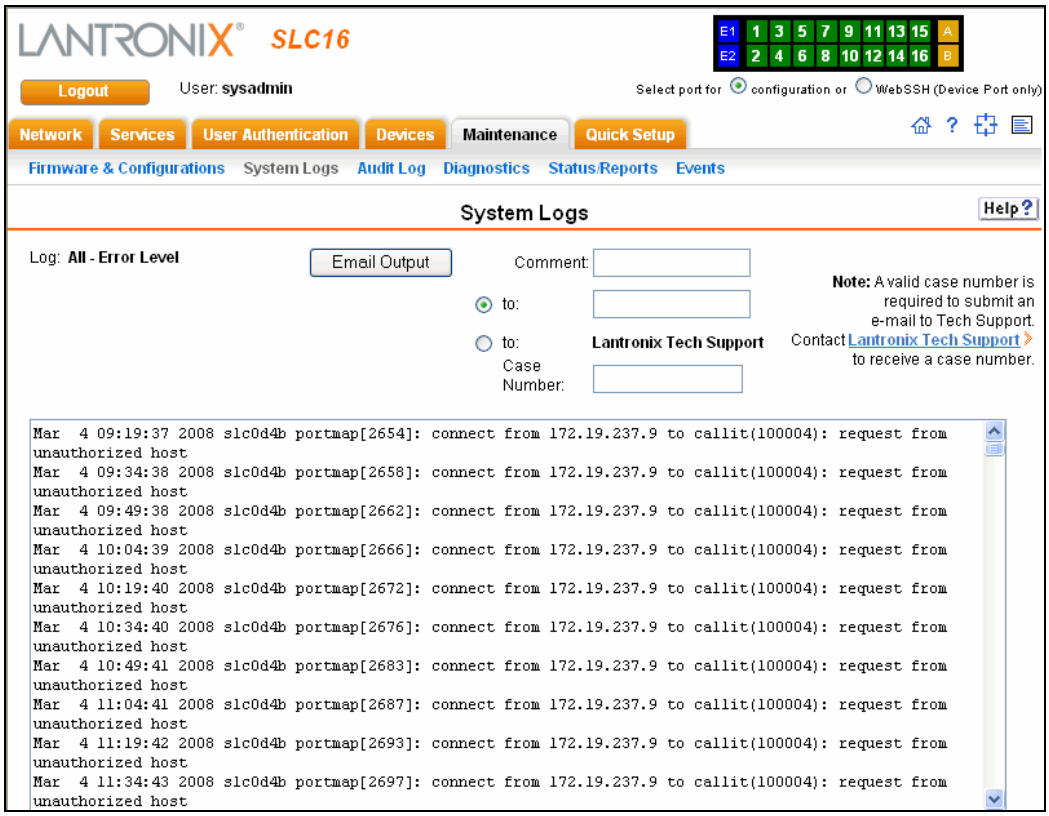
To view system logs:

1. Click the **Maintenance tab** and select the **System Logs** option. The following page displays:

2. Enter the following:

Log	Select the type(s) of log you want to view.
Level	Select the alert level you want to view for the selected log.
Starting at	Select the starting point of the range you want to view: **Beginning of Log:** Beginning of the log. **Date:** Specific start date and time of the log.
Ending at	Select the endpoint of the range you want to view: **End of Log:** The end of the log. **Date:** Specific end date and time of the log.

3. Click the **View Log** button. The log displays. For example, if you select the type **All** and the level **Error**, the SLC displays a log similar to this:



4. To email the system log to an individual:
   a) In the **Comment** field, enter a comment (if desired).
   b) Select **to** and enter the person's email address.
   c) Press the **Email Output** button.
5. To email the system log to Lantronix Technical Support:
   a) In the **Comment** field, enter a comment (if desired).
   b) Select **to: Lantronix Tech Support.**
   c) Call Lantronix Tech Support and obtain a case number.

   Note: *For contact information, click the* ***Lantronix Tech Support*** *link.*

   d) Enter the number in **Case Number**.
   e) Press the **Email Output** button.
6. A message asks for confirmation. Click **OK**.

To clear system logs:

1. Return to the System Logs page.
2. Select the logs you want to clear and click the **Clear Log** button.

System Log Command

The following command for the command line interface corresponds to the web page entries described above.

To view the system logs containing information and error messages:

```
show syslog [<parameters>]
```

Parameters:

```
[email <Email Address>]
level <error|warning|info|debug>
log <all|netlog|servlog|authlog|devlog|diaglog|genlog>
display <head|tail> [numlines <Number of Lines>]
startingtime <MMDDYYhhmm [ss]
endtime <MMDDYYhhmm [ss]
```

Note: *The level and display parameters cannot be used simultaneously.*

To clear one or all of the system logs:

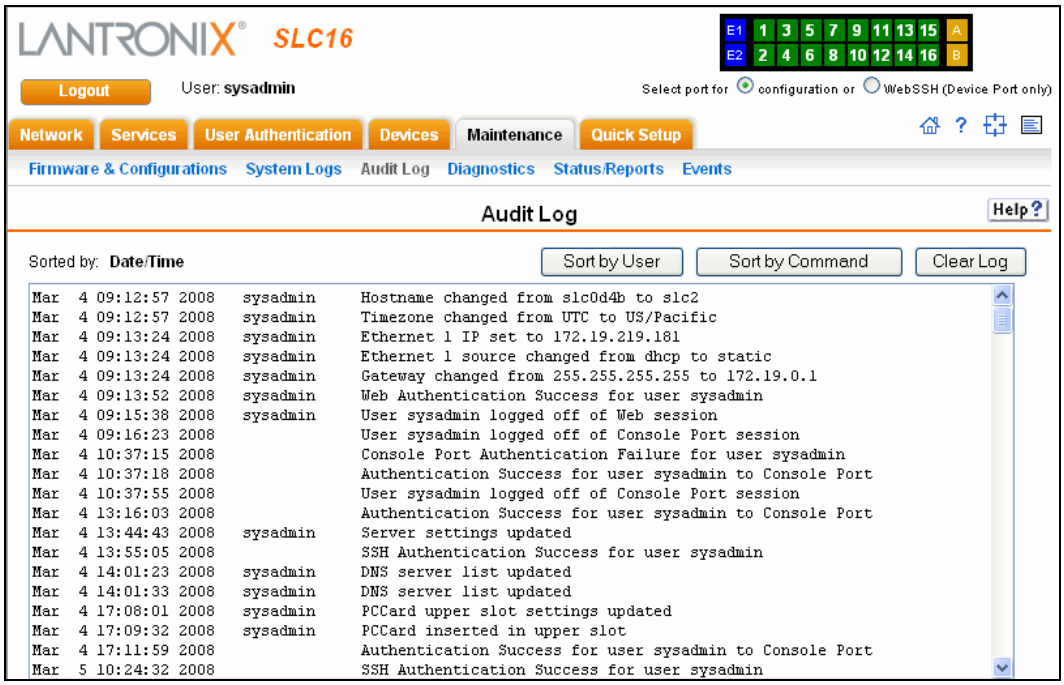
```
show syslog clear
<all|netlog|servlog|authlog|devlog|diaglog|genlog>
```

Audit Log

The Audit Log web page displays a log of all actions that have changed the configuration of the SLC. The audit log is disabled by default. Use the Services web page (*7: Services*) to enable the audit log and to configure its maximum size.

Each entry in the log file contains a date/time stamp, user login, and the action performed by the user. The user may clear the log file and sort the log by date/time, user, and command. **The audit log is saved through SLC reboots.**

1. Click the **Maintenance** tab and select the **Audit Log** option. The following page displays:



2. To select a sort option (by User or Command) click the appropriate button:
   - To sort by user, click the **Sort by User** button.
   - To sort by command/action, click the **Sort by Command** button.
3. To clear the log, click the **Clear Log** button.

Diagnostics

The Diagnostics web page provides methods for diagnosing problems such as network connectivity and device port input/output problems. You can use equivalent commands on the command line interface. An additional diagnostic, loopback, is only available as a command.

1. Click the **Maintenance** tab and select the **Diagnostics** option. The following page displays:

2. Enter the following:

Select Diagnostics	Select one or more diagnostic methods you want to run, or select **All** to run them all.
ARP Table	Address Resolution Protocol (ARP) table used to view the IP address-to-hardware address mapping.
Netstat	Displays network connections. If you select the checkbox, select a protocol or select **All** for both protocols to control the output of the Netstat report.
Host Lookup	If you enter a host name in the corresponding **Hostname** field, verifies that the SLC can resolve the host name into an IP address (if DNS is enabled).
Ping	If you enter a host name in the corresponding **Hostname** field, verifies that the host is up and running.

Send Packet	This option sends an Ethernet packet out one of the Ethernet ports, mainly as a network connectivity test. Enter the following: **Protocol:** Select the type of packet to send. **Hostname:** Specify a host name or IPaddress of the host to send the packet to. **Port:** Specify a **TCP** or **UDP** port number of the host to send the packet to. **String:** Enter a set of up to 64 characters. The string is encapsulated in the packet (so you could use a network sniffer to track the packet and, by looking at its contents, verify that it was sent). **Count:** The count is the number of times the string is sent. For UDP, the number of times the string is sent is equal to the number of packets sent. For TCP, the number of times the string is sent may (or may not) be equal to the number of packets sent, because TCP controls how data is packetized and sent out.

3. Click the **Run Diagnostics** button. The Diagnostics report page displays.

4. To view a report, click the link for that report. The links display at the top left of the page.

5. To email the report(s) to an individual:
   a) In the **Comment** field, enter a comment (if desired).
   b) Select **to** and enter the person's email address.
   c) Press the **Email Output** button.
6. To email the report(s) to Lantronix Technical Support:
   a) In the **Comment** field, enter a comment (if desired).
   b) Select **to: Lantronix Tech Support**
   c) Call Lantronix Tech Support and obtain a case number.

   Note: *For contact information, click the* ***Lantronix Tech Support*** *link.*
   d) Enter the number in **Case Number**.
   e) Press the **Email Output** button.

Diagnostic Commands

The following CLI commands correspond to the web page entries described above.

To display the ARP table of IP address-to-hardware address mapping:

```
diag arp [email <Email Address>]
```

You can optionally email the displayed information.

To display a report of network connections:

You can optionally email the displayed information.

```
diag netstat [protocol <all|tcp|udp>] [email <Email Address>]
```

To resolve a host name into an IP address:

You can optionally email the displayed information.

```
diag lookup <Hostname> [email <Email Address>]
```

To test a device port by transmitting data out the port and verifying that it is received correctly:

```
diag loopback <Device Port Number or Name>[<parameters>]
```

Parameters:

```
test <internal|external>
```

```
xferdatasize <Size In Kbytes to Transfer>
```

Default is ***1*** *Kbyte.*

Note: *A special loopback cable comes with the SLC. To test a device port, plug the cable into the device port and run this command. The command sends the specified Kbytes to the device port and reports success or failure. The test is performed at 9600 baud. Only an external test requires a loopback cable.*

To display the route that packets take to get to a network host:

```
diag traceroute <IP Address or Hostname>
```

To verify that the host is up and running:

`diag ping <IP Address or Name> [<parameters>]`

Parameters:

`count <Number of Times to Ping>`
*The default is **5**.*

`packetsize <Size in Bytes>`
*The default is **64**.*

To display performance statistics for an Ethernet port or a device port (averaged over the last 5 seconds):

`diag perfstat [ethport <1|2>] [deviceport <Device Port # or Name>]`

To generate and send Ethernet packets:

`diag sendpacket host <IP Address or Name> port <TCP or UDP Port Number> [string <Packet String>] [protocol <tcp|udp>] [count <Number of Packets>]`
*The default is **1**.*

To display all network traffic, applying optional filters:

***Note:** This command is not available*

`diag nettrace <one or more parameters>`

Parameters:

`ethport <1|2>`

`host <IP Address or Name>`

`numpackets <Number of Packets>`

`protocol <tcp|udp|icmp>`

`verbose <enable|disable>`

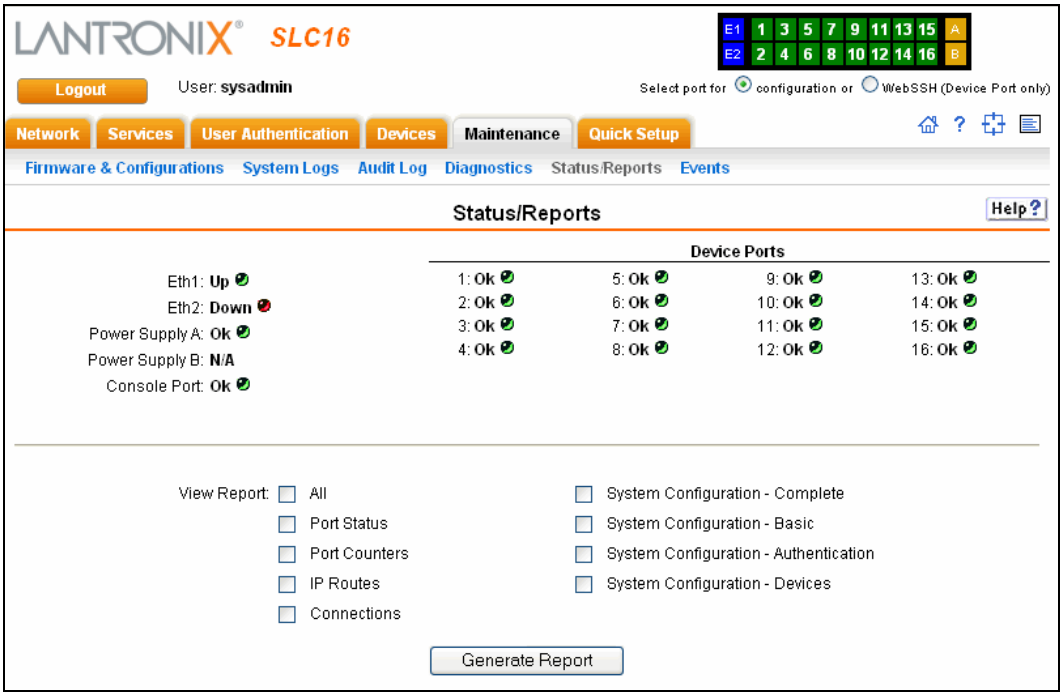
To display information on the internal memory, storage and processes of the SLC:
`diag internals`
***Note:** This command is available in the CLI but not the web.*

Status/Reports

On this page, you can view the status of the SLC ports and power supplies and generate a selection of reports.

Note: *Status and statistics shown on the web interface represent a snapshot in time. To see the most recent data, you must reload the web page.*

1. Click the **Maintenance** tab and select the **Status/Reports** option. The following page displays:



The top half of the page displays the status of each port and the power supplies. Green indicates that the port connection or power supply is active and functioning correctly. Red indicates an error or failure.

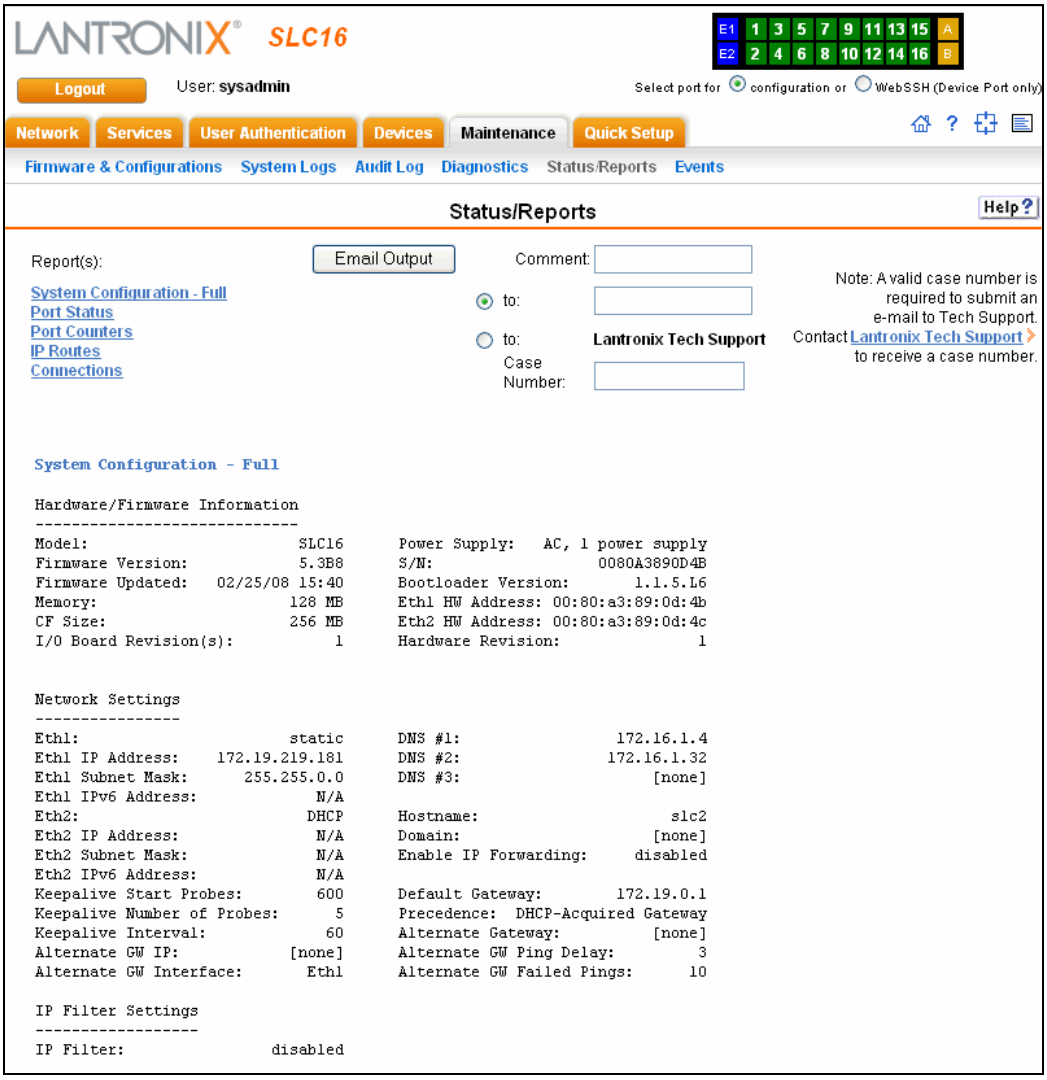
2. Enter the following:

View Report

View Report	Select as many of the reports as desired, or select **All**. **Port Status:** Displays the status of each device port: mode, user, any related connections, and serial port settings. **Port Counters:** Displays statistics related to the flow of data through each device port. **IP Routes:** Displays the routing table. **Connections:** Displays all active connections for the SLC: Telnet, SSH, TCP, UDP, device port, and modem. **System Configuration – Complete:** Displays a complete snapshot of the SLC settings.

	System Configuration – Basic: Displays a snapshot of the SLC's basic settings (for example, network, date/time, routing, services, console port). **System Configuration – Authentication:** Displays a snapshot of authentication settings only (including a list of all localusers). **System Configuration - Devices:** Displays a snapshot of settings for each device port and (each PC Card slot) for a PC Card.

3. Click the **Generate Report** button. In the upper left, the report page displays a list of reports generated.



4. To view a report, click the link for that report.
5. To email the report(s) to Lantronix Technical Support:
   a) In the **Comment** field, enter a comment (if desired).
   b) Select **to: Lantronix Tech Support**

c) Call Lantronix Tech Support and obtain a case number.

Note: *For contact information, click the* ***Lantronix Tech Support*** *link.*

d) Enter the number in **Case Number**.

e) Press the **Email Output** button.

6. To email the report(s) to an individual:

a) In the **Comment** field, enter a comment (if desired).

b) Select **to:** and enter the person's email address.

c) Press the **Email Output** button.

Status Commands

These commands for the command line interface correspond to the web page entries described above.

To display device port modes and states for one or more ports:
You can optionally email the displayed information.

```
show portstatus [deviceport <Device Port List or Name>] [email
<Email Address>]
```

To display a snapshot of configurable parameters:
You can optionally email the displayed information.

```
show sysconfig [display <basic|auth|devices>] [email <Email
Address]
```

Displays a report of all configurable parameters or a shorter report with basic system settings, authentication settings, or device settings.

To generate a report for one or more ports:
You can optionally email the displayed information.

```
show portcounters [deviceport <Device Port List or Name>] [email
<Email Address>]
```

To display the overall status of all SLC devices:
You can optionally email the displayed information.

```
show sysstatus [email <Email Address>]
```

To display a list of all current connections:
You can optionally email the displayed information.

```
show connections [email <Email Address>]
```

To provide details, e.g., endpoint parameters and trigger, for a specific connection:
You can optionally email the displayed information.

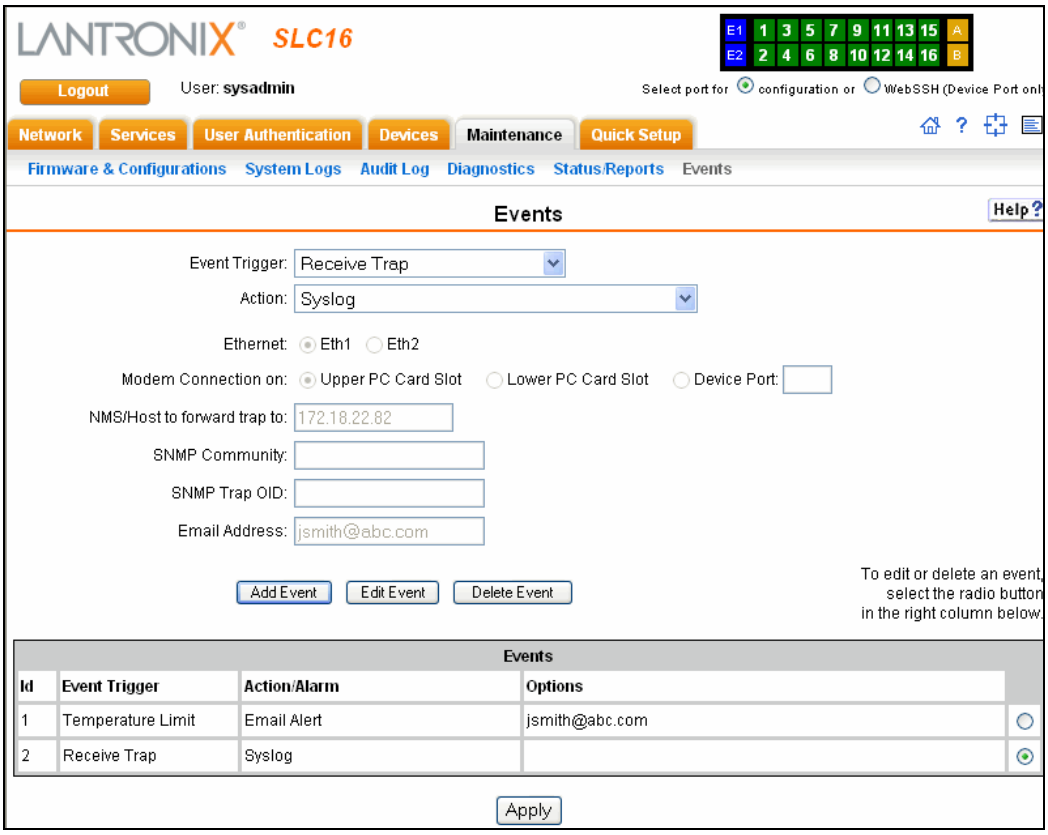
```
show connections connid <Connection ID> [email <Email Address>]
```

Note: *Use the basic* `show connections` *command to obtain the Connection ID.*

Events

On this page, you can define what action you want to take for events that may occur in the SLC.

1. Click the **Maintenance** tab and select the **Events** option. The following page displays:



2. Enter the following:

Event Trigger	From the drop-down list, select the type of incident that triggers an event. Currently, the options are: **Receive Trap** **Temperature Over/Under Limit:** For Sensorsoft devices. **Humidity Over/Under Limit:** For Sensorsoft devices.
Action	From the drop-down list, select the action taken because of the trigger. For example, the action can be writing an entry into the syslog with details of the event or sending the trap(s) to the Ethernet or modem connection.
Ethernet	For actions that require an Ethernet connection (for example, **Forward All Traps to Ethernet**), select the Ethernet port to use.
Modem Connection on	For actions that require a modem connection (for example, **Forward All Traps to a Modem Connection**, select which device port or PC Card slot with a modem connection to use.

NMS/Host to forward trap to	For actions that forward a trap, enter the IP address of the computer to forward the trap to. The computer does not have to be an SNMP NMS; it just has to be capable of receiving SNMP traps.
SNMP Community	Forwarded traps are sent with this SNMP community value There is no default.
SNMP Trap OID	Enter a unique identifier for an SNMP object. (An SNMP object is anything that can hold a value and can be read using an SNMP "get" action.) The OID consists of a string of numbers separated by periods (for example, 1.1.3.2.1). Each number is part of a group represented by the number on its left.
Email Address	Email address to receive email alerts.

3. You have the following options:
   - To add the defined event, click the **Add Event** button. The event displays in the Events table at the bottom of the page.
   - To edit an event, select the event from the Events table and click the **Edit Event** button. The Events page displays the event.
   - To delete an event, select the event from the Events table and click the **Delete Event** button. A message asks for confirmation. Click **OK**.
4. To save, click the **Apply** button.

Events Commands

To manage the response to events that occur in the SLC:

```
admin events add <trigger> <response>
```

<trigger> is one of:

```
|receivetrap|templimit|humidlimit|overcurrent|
```

<response> is one of:

```
action <syslog>

action <fwdalltrapseth|fwdseltrapeth> ethport <1|2>
nms <SNMP NMS> community <SNMP Community> [oid <SNMP
OID>]

action <fwdalltrapsmodem|fwdseltrapmodem> deviceport
<Device Port # or Name> nms <SNMP NMS> community <SNMP
Community> [oid <SNMP Trap OID>]

action <fwdalltrapsmodem|fwdseltrapmodem> pccardslot
<upper|lower> nms <SNMP NMS> community <SNMP
Community> [oid <SNMP Trap OID>]

action <emailalert> emailaddress <destination email
address>
```

To update event definitions:

```
admin events edit <Event ID> <parameters>
```

Parameters:

```
community <SNMP Community>
deviceport <Device Port # or Name>
ethport <1|2>
nms <SNMP NMS>
oid <SNMP Trap OID>
pccardslot <upper|lower>
emailaddress <destination email address>
```

To delete an event:

```
admin events delete <Event ID>
```

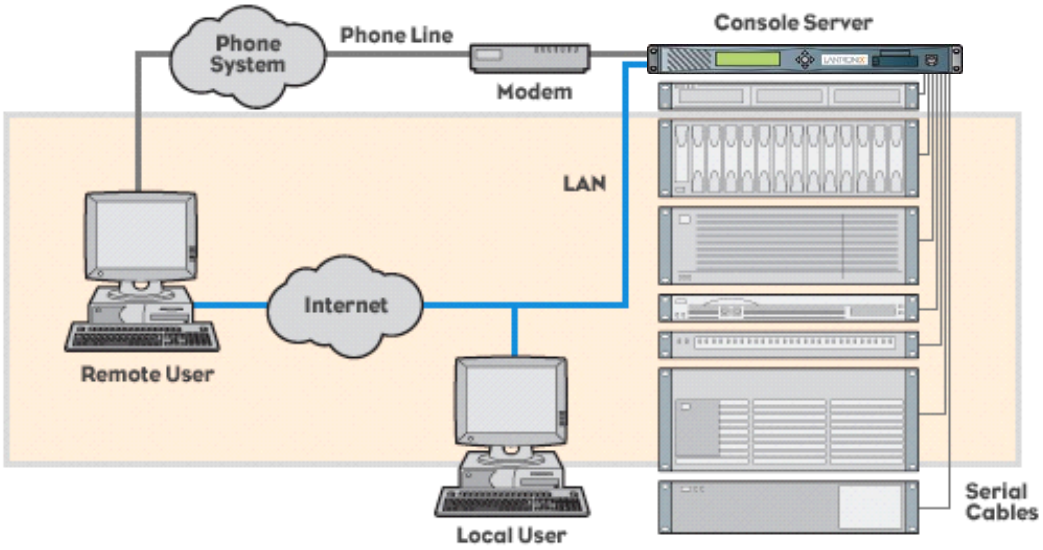
To view events:

```
admin events show
```

13: Application Examples

Each SLC has multiple serial ports and two network ports. Each serial port can be connected to the console port of an IT device. Using a network port (in-band) or a modem (out-of-band) for dial-up connection, an administrator can remotely access any of the connected IT devices using Telnet or SSH.

Figure 13-1. SLC Console Manager Configuration

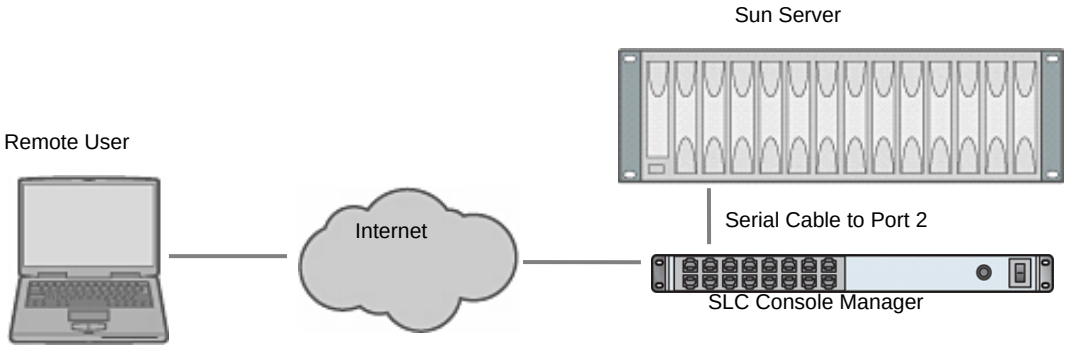


This chapter includes three typical scenarios for using the SLC. The scenarios assume that the SLC is connected to the network and has already been assigned an IP address. In the examples, we use the command line interface. You can do the same things using the web page interface except for directly interacting with the SLC (`direct` command).

Telnet/SSH to a Remote Device

The following figure shows a Sun server connected to port 2 of the SLC.

Figure 13-2. Remote User Connected to a SUN Server via the SLC



In this example, the sysadmin would:

1. Display the current settings for device port 2:

```
[slc]> show deviceport port 2
___Current Device Port
Settings_____________________________________________
Number: 2  Name: Port-2

Modem Settings-------------------Data Settings----------IP Settings---------
Modem State: disabled             Baud Rate: 9600        Telnet: disabled
Modem Mode: text                  Data Bits: 8           Telnet Port: 2002
Timeout Logins: disabled          Stop Bits: 1           SSH: disabled
Local IP: negotiate               Parity: none           SSH Port: 3002
Remote IP: negotiate              Flow Control: xon/xoff IP: <none>
Authentication: PAP               Logins: disabled
CHAP Host: <none>                 Break Sequence: \x1bB
CHAP Secret: <none>               Check DSR: disabled
NAT: disabled                     Close DSR: disabled
Dial-out Login: <none>
Dial-out Password: <none>
Dial-out Number: <none>
Dial-back Number: usernumber
Initialization Script: <none>

Logging Settings-----------------------------------------------------------
-
Local Logging: disabled           PC Card Logging: disabled
Email Logging: disabled           Log to: upper slot
Byte Threshold: 100               Max number of files: 10
Email Delay: 60   seconds         Max size of files: 2048
Restart Delay: 60   seconds
Email To: <none>
Email Subject: Port %d Logging
Email String: <none>
NFS File Logging: disabled
Directory to log to: <none>
Max number of files: 10
Max size of files: 2048
```

2. Change the baud to 57600 and disable flow control:

```
[slc]> set deviceport port 2 baud 57600 flowcontrol none
Device Port settings successfully updated.
```

3. Connect to the device port:

```
[slc]> connect direct deviceport 2
```

4. View messages from the SUN server console:

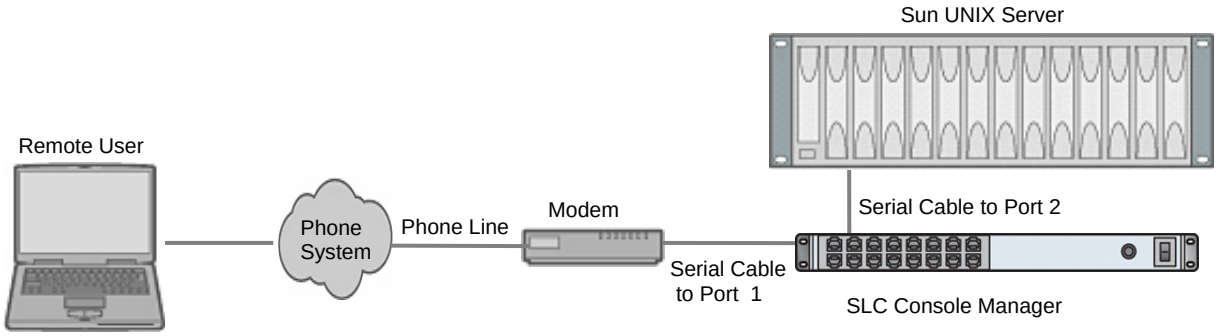
```
Mar 15 09:09:44 tssf280r sendmail[292]: [ID 702911 mail.info] starting daemon
(8.12.2+Sun): SMTP+queueing@00:15:00
Mar 15 09:09:44 tssf280r sendmail[293]: [ID 702911 mail.info] starting daemon
(8.12.2+Sun): queueing@00:15:00
Mar 15 14:44:40 tssf280r sendmail[275]: [ID 702911 mail.info] starting daemon
(8.12.2+Sun): SMTP+queueing@00:15:00
Mar 15 14:44:40 tssf280r sendmail[276]: [ID 702911 mail.info] starting daemon
(8.12.2+Sun): queueing@00:15:00
```

5. Reboot the SUN server:

```
reboot
<shutdown messages from SUN>
```

6. Use the escape sequence to escape from direct mode back to the command line interface.

Dial-in (Text Mode) to a Remote Device



This example shows a modem connected to an SLC device port, and a Sun server connected to another SLC device port. You can configure the modem for text mode dial-in, so a remote user can dial into the modem using a terminal emulation program and access the Sun server. (HyperTerminal, ™ which comes with the Microsoft ® Windows™ operating system, is an example of a terminal emulation program.)

In this example, the sysadmin would:

1. Configure the device port that the modem is connected to for dial-in:

```
[slc]> set deviceport port 1 modemmode text
Device Port settings successfully updated.

[slc]> set deviceport port 1 initscript "AT&F&K3&C1&D2%C0A"
Device Port settings successfully updated.

[slc]> set deviceport port 1 auth pap
```

```
Device Port settings successfully updated.

[slc]> set deviceport port 1 localsecret "password"
Device Port settings successfully updated.

[slc]> set deviceport port 1 modemstate dialin
Device Port settings successfully updated.

[slc]>
```

2. Configure the device port that is connected to the console port of the Sun UNIX server:

```
[slc]> set deviceport port 2 baud 57600 flowcontrol none
Device Port settings successfully updated.
```

3. Dial into the SLC via the modem using a terminal emulation program on a remote PC. A command line prompt displays.
4. Log into the SLC.

```
CONNECT 57600

Welcome to the SLC

login: sysadmin
Password:

Welcome to the SecureLinx Console Manager
Model Number: SLC48
For a list of commands, type 'help'.

[slc]>
```

5. Connect to the SUN Unix server using the `direct` command.

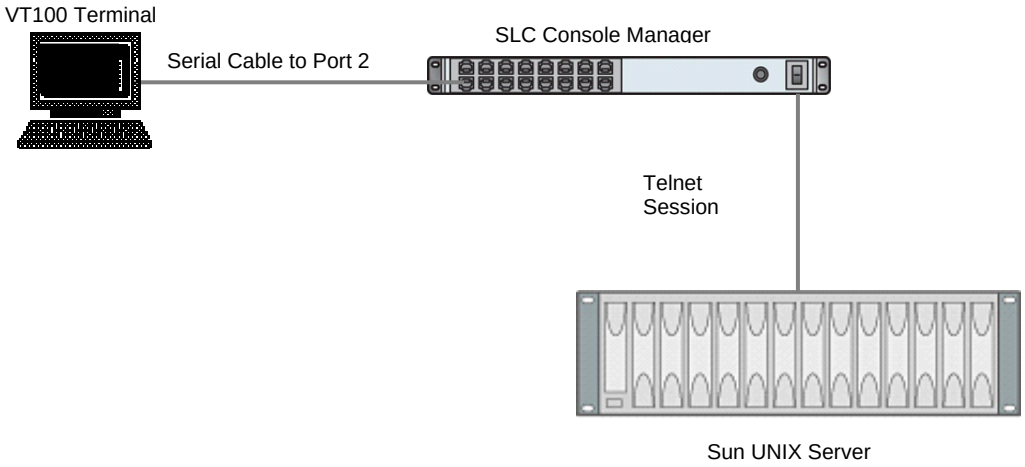
```
[slc]> connect direct deviceport 2
SunOS 5.7

login: frank
Password:
Last login: Wed Jul 14 16:07:49 from computer
Sun Microsystems Inc.   SunOS 5.7       Generic October 1998
SunOS computer 5.7 Generic_123485-05 sun4m sparc SUNW,SPARCstation-20
$
```

6. Use the escape sequence to escape from direct mode back to the command line interface.

Local Serial Connection to Network Device via Telnet

This example shows a terminal device connected to an SLC device port, and a Sun server connected over the network to the SLC. When a connection is established between the device port and an outbound Telnet session, users can access the Sun server as though they were directly connected to it. (See *10: Connections* for more information).



In this example, the sysadmin would:

1. Display the current settings for device port 2:

```
[slc]> show deviceport port 2
___Current Device Port Settings_____________________________________________
Number: 2  Name: Port-2

Modem Settings-------------------Data Settings----------IP Settings---------
Modem State: disabled             Baud Rate: 9600        Telnet: disabled
Modem Mode: text                  Data Bits: 8           Telnet Port: 2002
Timeout Logins: disabled          Stop Bits: 1           SSH: disabled
Local IP: negotiate               Parity: none           SSH Port: 3002
Remote IP: negotiate              Flow Control: xon/xoff IP: <none>
Authentication: PAP               Logins: disabled
CHAP Host: <none>                 Break Sequence: \x1bB
CHAP Secret: <none>               Check DSR: disabled
NAT: disabled                     Close DSR: disabled
Dial-out Login: <none>
Dial-out Password: <none>
Dial-out Number: <none>
Dial-back Number: usernumber
Initialization Script: <none>

Logging Settings-----------------------------------------------------------
Local Logging: disabled           PC Card Logging: disabled
Email Logging: disabled           Log to: upper slot
Byte Threshold: 100               Max number of files: 10
Email Delay: 60   seconds         Max size of files: 2048
Restart Delay: 60   seconds
Email To: <none>
Email Subject: Port %d Logging
Email String: <none>
NFS File Logging: disabled
Directory to log to: <none>
Max number of files: 10
Max size of files: 2048
```

2. Change the serial settings to match the serial settings for the vt100 terminal - changes baud to 57600 and disables flow control:

```
[slc]> set deviceport port 2 baud 57600 flowcontrol none
Device Port settings successfully updated.
```

3. Create a connection between the vt100 terminal connected to device port 2 and an outbound telnet session to the server. (The IP address of the server is 192.168.1.1):

```
[slc]> connect bidirection 2 telnet 192.168.1.1
Connection settings successfully updated.
```

4. At the VT100 terminal, hit <return> a couple of times. The Telnet prompt from the server displays:

```
Trying 192.168.1.1...
Connected to 192.168.1.1.
Escape character is '^]'.

Sun OS 8.0

login:
```

At this point, a user can log in and interact with the Sun server at the VT100 terminal as if directly connected to the server.

14: Command Reference

After an introduction to using commands, this chapter lists and describes all of the commands available on the SLC command line interface accessed through Telnet, SSH, or a serial connection. The commands are in alphabetical order by category.

Introduction to Commands

Following is some information about command syntax, command line help, and tips for using commands. For more detailed information about commands, see *Command Line Interface* on page 36.

Command Syntax

Commands have the following format:

`<action> <category> <parameter(s)>`

where

`<action>` is set, show, connect, admin, diag, pccard, or logout.

`<category>` is a group of related parameters whose settings you want to configure or view. Examples are ntp, deviceport, and network.

`<parameter(s)>` is one or more name-value pairs in one of the following formats:

`<parameter name> <aa|bb>`	User must specify one of the values (aa or bb) separated by a vertical line (|). The values are in all lowercase and must be entered exactly as shown. Bold indicates a default value.
`<parameter name> <Value>`	User must specify an appropriate value, for example, an IP address. The parameter values are in mixed case. Square brackets [ ] indicate optional parameters.

Table 14-1. Actions and Category Options

Action	Category
set	network | ipfilter | routing | datetime | ntp | services | nfs | cifs | menu | hostlist | auth | localusers | remoteusers | ldap | radius | kerberos | tacacs+ | consoleport | deviceport | nis | slcnetwork | command | sshkey | password | history | cli | locallog |
show	network | ipfilter | routing | datetime | ntp | services | nfs | cifs | menu | hostlist | auth | localusers | nis | ldap | radius | kerberos | tacacs+ | consoleport | deviceport | locallog | sysstatus | syslog | auditlog | portstatus | sysconfig | portcounters | connections | slcnetwork | sshkey | history | cli | user | remoteusers
connect	direct | listen | bidirection | unidirection | terminate | global
diag	ping | loopback | traceroute | arp | lookup | netstat | perfstat | sendpacket | nettrace | internals
pccard	storage | modem
admin	reboot | shutdown | ftp | config | firmware | version | banner | keypad | quicksetup | web | events |lcd
logout	Terminates CLI session.

Command Line Help

For general Help and to display the commands to which you have rights, type:

```
help
```

For general command line Help, type:

```
help command line
```

For more information about a specific command, type `help` followed by the command, for example:

`help set network` **or** `help admin firmware`

Tips

- Type enough characters to identify the action, category, or parameter name uniquely. For parameter values, type the entire value. For example, you can shorten:

  ```
  set network port 1 state static ipaddr 122.3.10.1 mask 255.255.0.0
  ```

  to

  ```
  se net po 1 st static ip 122.3.10.1 ma 255.255.0.0
  ```

- Use the **Tab** key to automatically complete action, category, or parameter names. Type a partial name and press **Tab** either to complete the name if only one is possible, or to display the possible names if more than one is possible. Following a space after the preceding name, **Tab** displays all possible names.
- Should you make a mistake while typing, backspace by pressing the **Backspace** key and/or the **Delete** key, depending on how you accessed the interface. Both keys work if you use VT100 emulation in your terminal access program when connecting to the console port. Use the **left** and **right** arrow keys to move within a command.

- Use the **up** and **down arrows** to scroll through previously entered commands. If desired, select one and edit it. You can scroll through up to 100 previous commands entered in the session.
- To clear an IP address, type **`0.0.0.0`**, or to clear a non-IP address value, type **`CLEAR`**.
- When the number of lines displayed by a command exceeds the size of the window (the default is 25), the command output is halted until the user is ready to continue. To display the next line, press **Enter**, and to display the page, press the space bar. You can override the number of lines (or disable the feature altogether) with the `set cli` command.

Administrative Commands

admin banner login

Syntax

```
admin banner login <Banner Text>
```

Description

Configures the banner displayed after the user logs in.

Note: *To go to the next line, type* ***\n*** *and press* ***Enter****.*

admin banner logout

Syntax

```
admin banner logout <Banner Text>
```

Description

Configures the banner displayed after the user logs out.

Note: *To go to the next line, type* ***\n*** *and press* ***Enter****.*

admin banner show

Syntax

```
admin banner show
```

Description

Displays the welcome, login and logout banners.

admin banner welcome

Syntax

```
admin banner welcome <Banner Text>
```

Description

Configures the banner displayed before the user logs in.

Note: *To go to the next line, type* ***\n*** *and press* ***Enter****.*

admin config delete

Syntax

```
admin config delete <Config Name> location <default|cifs|pccard>
[pccardslot <upper|lower>]
```

Description

Deletes a configuration.

admin config factorydefaults

Syntax

```
admin config factorydefaults [savesshkeys <enable|disable>] [savesslcert
<enable|disable>] [preserveconfig <Config Params to Preserve>]
```

<Config Params to Preserve> is a comma-separated list of current configuration parameters to retain after the config restore or factorydefaults:

nt – Networking	lu - Local Users
sv – Services	dp - Device Ports
dt - Date/Time	pc - PC Card

Description

Restores the SLC to factory default settings.

admin config restore

Syntax

```
admin config restore <Config Name> location
<default|ftp|sftp|nfs|cifs|pccard> [nfsdir <NFS Mounted Dir>]
[pccardslot <upper|lower>] [preserveconfig <Config Params to Preserve>]
```

<Config Params to Preserve> is a comma-separated list of current configuration parameters to retain after the config restore or factorydefaults:

nt – Networking	lu - Local Users
sv – Services	dp - Device Ports
dt - Date/Time	pc - PC Card

Description

Restores a saved configuration to the SLC.

admin config save

Syntax

```
admin config save <Config Name> location
<default|ftp|sftp|nfs|cifs|pccard> [nfsdir <NFS Mounted Dir>]
[pccardslot <upper|lower>]
```

Description

Saves the current SLC configuration to a selected location.

admin config show

Syntax

```
admin config show <default|ftp|sftp|nfs|cifs|pccard> [nfsdir <NFS Mounted Dir>] [pccardslot <upper|lower>]
```

Description

Lists the configurations saved to a location.

admin firmware bootbank

Syntax

```
admin firmware bootbank <1|2>
```

Description

Sets the boot bank to be used at the next SLC reboot. Applies to dual-boot SLCs only.

admin firmware copybank

Syntax

```
admin firmware copybank
```

Description

Copies the boot bank from the currently booted bank to the alternate bank (for dual-boot SLCs).

admin firmware show

Syntax

```
admin firmware show [viewlog <enable|disable>]
```

Description

Lists the current firmware revision, the boot bank status (for dual-boot SLCs), and optionally displays the log containing details about firmware updates.

admin firmware update

Syntax

```
admin firmware update <ftp|tftp|sftp|> file <Firmware File> key <Checksum Key>
```

Description

Updates SLC firmware to a new revision.

You should be able to access the firmware file using the settings `admin ftp show` displays. The SLC automatically reboots after successful update.

admin ftp password

Syntax

```
admin ftp password
```

Description

Sets the FTP server password and prevent it from being echoed.

admin ftp server

Syntax

```
admin ftp server <IP Address or Hostname> [login <User Login>] [path
<Directory>]
```

Description

Sets the FTP/TFTP/SFTP server used for firmware updates and configuration save/restore.

admin ftp show

Syntax

```
admin ftp show
```

Description

Displays FTP settings.

admin keypad

Syntax

```
admin keypad <lock|unlock>
```

Description

Locks or unlocks the LCD keypad.

If the keypad is locked, you can scroll through settings but not change them.

admin keypad password

Syntax

```
admin keypad password <Password>
```

Must be 6 digits.

Description

Changes the Restore Factory Defaults password used at the LCD to return the SLC to the factory settings.

admin keypad show

Syntax

```
admin keypad show
```

Description

Displays keypad settings.

admin quicksetup

Syntax

```
admin quicksetup
```

Description

Runs the quick setup script.

admin reboot

Syntax

```
admin reboot
```

Description

Reboots the SLC.

The front panel LCD displays the “Rebooting the SLC” message, and the normal boot sequence occurs.

admin shutdown

Syntax

```
admin shutdown
```

Description

Prepares the SLC to be powered off.

When you use this command to shut down the SLC, the LCD front panel displays the “Shutting down the SLC” message, followed by a pause, and then “Shutdown complete.” When “Shutdown complete” displays, it is safe to power off the SLC. This command is not available on the Web page.

admin version

Syntax

```
admin version
```

Description

Displays current hardware and firmware information.

admin web certificate

Syntax

```
admin web certificate import via <sftp|scp> certfile <Certificate File>
          privfile <Private Key File> host <IP Address or Name>
          login <User Login> [path <Path to Files>]
```

Description

Imports an SSL certificate.

admin web certificate reset

Syntax

```
admin web certificate reset
```

Description

Resets a web certificate.

admin web certificate show

Syntax

```
admin web certificate show
```

Description

Displays a web certificate.

admin web gadget

Syntax

```
admin web gadget <enable|disable>
```

Description

Enables or disables iGoogle Gadget web content.

admin web timeout

Syntax

```
admin web timeout <disable|5-120>
```

Description

```
Configures the timeout for web sessions.
```

admin web terminate

Syntax

```
admin web terminate <Session ID>
```

Description

```
Terminates a web session.
```

admin web show

Syntax

```
admin web show
```

Description

```
Displays the current sessions and their ID.
```

```
Add ‘admin web certificate’ commands
```

Audit Log Commands

show auditlog

Syntax

```
show auditlog [command|user|clear]
```

Description

Displays audit log. By default, shows the audit log sorted by date/time. You can sort it by user or command, or clear the audit log.

Authentication Commands

set auth

Syntax

```
set auth <one or more parameters>
```

Parameters

```
authusenextmethod <enable|disable>
kerberos <1-6>
ldap <1-6>
localusers <1-6>
nis <1-6>
radius <1-6>
tacacs+ <1-6>
```

Description

Sets ordering of authentication methods.

Local Users authentication is always the first method used. Any methods omitted from the command are disabled.

show auth

Syntax

```
show auth
```

Description

Displays authentication methods and their order of precedence.

show user

Syntax

```
show user
```

Description

Displays attributes of the currently logged in user.

Kerberos Commands

set kerberos

Syntax

```
set kerberos <one or more parameters>
```

Parameters

```
breakseq <1-10 Chars>
clearports <Port List>
custommenu <Menu Name>
dataports <Port List>
```

```
escapeseq <1-10 Chars>
group <default|power|admin>
ipaddr <Key Distribution Center IP Address>
kdc <Key Distribution Center>
listenports <Port List>
port <Key Distribution Center TCP Port>
realm <Kerberos Realm>
state <enable|disable>
useldapforlookup <enable|disable>
permissions <Permission List>
```

Note: See User Permissions Commands on page 216 for information on groups and user rights.

Description

Configures the SLC to use Kerberos to authenticate users who log in via the Web, SSH, Telnet, or the console port.

show kerberos

Syntax

```
show kerberos
```

Description

Displays Kerberos settings.

LDAP Commands

set ldap

Syntax

```
set ldap <one or more parameters>
```

Parameters

```
adsupport <enable|disable>
base <LDAP Base>
bindname <Bind Name>
bindpassword <Bind Password>
breakseq <1-10 Chars>
clearports <Port List>
clearports <Port List>
custommenu <Menu Name>
dataports <Port List>
dataports <Ports List>
encrypt <enable|disable>
escapeseq <1-10 Chars>
group <default|power|admin>
listenports <Port List>
```

listenports <Port List>
permissions <Permission List>
port <TCP Port>
server <IP Address or Hostname>
state <enable|**disable**>
Default is **389**.

Note: *See User Permissions Commands on page 216 for information on groups and user rights.*

Description

Configures the SLC to use LDAP to authenticate users who log in via the Web, SSH, Telnet, or the console port.

show ldap

Description

Displays LDAP settings:

Syntax

show ldap

Local Users Commands

set localusers

Syntax

set localusers add|edit <User Login> <one or more parameters>

Parameters

allowdialback <enable|**disable**>
breakseq <1-10 Chars>
changenextlogin <enable|disable>
changepassword <enable|disable>
clearports <Port List>
custommenu <Menu Name>
dataports <Port List>
dialbacknumber <Phone Number>
displaymenu <enable|disable>
escapeseq <1-10 Chars>
group <default|power|admin>
listenports <Port List>
passwordexpires <enable|disable>
permissions <Permission List>

Note: *See User Permissions Commands on page 216 for information on groups and user rights.*

uid <User Identifier>

Description

Configures local accounts (including sysadmin) who log in to the SLC by means of the Web, SSH, Telnet, or the console port.

set localusers allowreuse

Syntax

```
set localusers allowreuse <enable|disable>
```

Description

Sets whether a login password can be reused.

set localusers complexpasswords

Syntax

```
set localusers complexpasswords <enable|disable>
```

Description

Sets whether a complex login password is required.

set localusers delete

Syntax

```
set localusers delete <User Login>
```

Description

Deletes a local user.

set localusers lifetime

Syntax

```
set localusers lifetime <Number of Days>
```

Description

Sets the number of days the login password may be used. The default is 90 days.

set localusers maxloginattempts

Syntax

```
set localusers maxloginattempts <Number of Logins>
```

Description

Sets the maximum number of login attempts before the account is locked. Disabled by default.

set localusers password

Syntax

```
set localusers password <User Login>
```

Description

Sets a login password for the local user.

set localusers periodlockout

Syntax

```
set localusers periodlockout <Number of Minutes>
```

Description

Sets the number of minutes after a lockout before the user can try to log in again. Disabled by default.

set localusers periodwarning

Syntax

```
set localusers periodwarning <Number of Days>
```

Description

Sets the number of days the system warns the user that the password will be expiring. The default is 7 days.

set localusers reusehistory

Syntax

```
set localusers reusehistory <Number of Passwords>
```

Description

Sets the number of passwords the user must use before reusing an old password. The default is 4.

set localusers state

Syntax

```
set localusers state <enable|disable>
```

Description

Enables or disables authentication of local users.

show localusers

Syntax

```
show localusers [user <User Login>]
```

Description

Displays local users.

NIS Commands

set nis

Syntax

```
set nis <one or more parameters>
```

Parameters

```
breakseq <1-10 Chars>
broadcast <enable|disable>
```

clearports <Port List>

custommenu <Menu Name>

dataports <Port List>

domain <*NIS Domain Name*>

escapeseq <1-10 Chars>

group <default|power|admin>

listenports <Port List>

master <*IP Address* or *Hostname*>

permissions <Permission List>

Note: *See User Permissions Commands on page 216 for information on groups and user rights.*

slave1 <*IP Address* or *Hostname*>

slave2 <*IP Address* or *Hostname*>

slave3 <*IP Address* or *Hostname*>

slave4 <*IP Address* or *Hostname*>

slave5 <*IP Address* or *Hostname*>

state <enable|**disable**>

Description

Configures the SLC to use NIS to authenticate users who log in via the Web, SSH, Telnet, or the console port.

show nis

Syntax

show nis

Description

Displays NIS settings.

RADIUS Commands

set radius

Syntax

set radius <one or more parameters>

Parameters:

breakseq <1-10 Chars>

clearports <Port List>

custommenu <Menu Name>

custommenu <Menu Name>

dataports <Port List>

escapeseq <1-10 Chars>

group <default|power|admin>

listenports <Port List>

state <enable|**disable**>

`permissions <Permission List>`
Note: *See User Permissions Commands on page 216 for information on groups and user rights.*

`timeout <enable|1-30>`
*Sets the number of seconds after which the connection attempt times out. It m*ay be 1-30 seconds.

Description

Configures the SLC to use RADIUS to authenticate users who log in via the Web, SSH, Telnet, or the console port.

set radius server

Syntax

```
set radius server <1|2> host <IP Address or Hostname> secret <Secret>
[port <TCP Port>]
```

Description

Identifies the RADIUS server(s), the text secret, and the number of the TCP port on the RADIUS server.

Note: *The default port is 1812.*

show radius

Syntax

```
show radius
```

Description

Displays RADIUS settings.

TACACS+ Commands

set tacacs+

Syntax

```
set tacacs+ <one or more parameters>
```

Parameters

`breakseq <1-10 Chars>`

`clearports <Port List>`

`custommenu <Menu Name>`

`dataports <Port List>`

`encrypt <`**`enable`**`|disable>`

`escapeseq <1-10 Chars>`

`group <default|power|admin>`

`listenports <Port List>`

`permissions <Permission List>`
Note: *See User Permissions Commands on page 216 for information on groups and user rights.*

`secret <TACACS+ Secret>`

`server1 <IP Address or Name>`

```
server2 <IP Address or Name>
server3 <IP Address or Name>
state <enable|disable>
```

Description

Configures the SLC to use TACACS+ to authenticate users who log in via the Web, SSH, Telnet, or the console port.

show tacacs+

Syntax

```
show tacacs+
```

Description

Displays TACACS+ settings.

User Permissions Commands

The following commands are available for the CLI only:

To block (lock out) a user's ability to log in:

```
set localusers lock <User Login>
```

To allow (unlock) a user's ability to log in:

```
set localusers unlock <User Login>
```

set localusers group

Syntax

```
set localusers add|edit <user> group <default|power|admin>
```

Description

Adds a local user to a user group or changes the group the user belongs to.

set localusers lock

Syntax

```
set local users unlock <User Login>
```

Description

Blocks (locks) a user's ability to login.

set localusers unlock

Syntax

```
set local users unlock <User Login>
```

Description

Allows (unlocks) a user's ability to login.

set localusers permissions

Syntax

```
set localusers add|edit <user> permissions <Permission List>
```

where

`<Permission List>` is one or more of `nt, sv, dt, lu, ra, sk, um, dp, pc, rs, rc, dr, wb, sn, ad`

To remove a permission, type a minus sign before the two-letter abbreviation for a user permission.

Description

Sets a local user's permissions (not defined by the user group).

set remoteusers <add|edit>

Syntax

```
set remoteusers add|edit <User Login> [<parameters>]
```

Parameters

```
breakseq <1-10 Chars>listenports <Port List>
clearports <Port List>
dataports <Port List>
escapeseq <1-10 Chars>
group <default|power|admin>
permissions <Permissions List>
```

where

`<Permission List>` is one or more of `nt, sv, dt, lu, ra, sk, um, dp, pc, rs, rc, dr, wb, sn, ad`

To remove a permission, type a minus sign before the two-letter abbreviation for a user right.

Description

Sets attributes for users who log in by a remote authentication method.

set remoteusers listonlyauth

Syntax

```
set remoteusers listonlyauth <enable|disable>
```

Description

Sets whether remote users who are not part of the remote user list will be authenticated.

set remoteusers delete

Syntax

```
set remoteusers delete <User Login>
```

Description

Removes a remote user.

show remoteusers

Syntax

```
show remoteusers
```

Description

Displays settings for all remote users

set <nis|ldap|radius|kerberos|tacacs+> group

Syntax

```
set <nis|ldap|radius|kerberos|tacacs> group <default|power|admin>
```

Description

Sets a permission group for remotely authorized users.

set <nis|ldap|radius|kerberos|tacacs+> permissions

Syntax

```
set <nis|ldap|radius|kerberos|tacacs> permissions <Permission List>
```

where
`<Permission List>` is one or more of `nt, sv, dt, lu, ra, sk, um, dp, pc, rs, rc, dr, wb, sn, ad`

Description

Sets permissions not already defined by the assigned permissions group.

show user

Syntax

```
show user
```

Description

Displays the rights of the currently logged-in user:

CLI Commands

set cli

Syntax

```
set cli scscommands <enable|disable>
```

Description

Allows you to use SCS-compatible commands as shortcuts for executing commands. Enabling this feature enables it only for the current cli session. It is disabled by default.

Note: *Settings are retained between CLI sessions for local users and users listed in the remote users list.*

set cli menu start

Syntax

```
set cli menu start
```

Description

Starts the menu if the menu associated with the current user does not display.

set cli terminallines

Syntax

```
set cli terminallines <disable|Number of lines>
```

Description

Sets the number of lines in the terminal emulation (screen) for paging through text one screenful at a time, if the SLC cannot detect the size of the terminal automatically.

Note: *Settings are retained between CLI sessions for local users and users listed in the remote users list.*

set localusers lock

Syntax

```
set localusers lock <User Login>
```

Description

Block (lock out) a user's ability to log in.

set localusers unlock

Syntax

```
set localusers unlock <User Login>
```

Description

Allow (unlock) a user's ability to log in.

show user

Syntax

```
show user
```

Description

Displays attributes of the currently logged in user.

set history

Syntax

```
set history clear
```

Description

Clears the commands that have been entered during the command line interface session.

show history

Syntax

```
show history
```

Description

Displays the last 100 commands entered during the session.

Connection Commands

connect bidirection

Syntax

```
connect bidirection <Port # or Name> <endpoint> <one or more Parameters>
```

Parameters

Endpoint is one of:

```
charcount <# of Chars>
charseq <Char Sequence>
charxfer <toendpoint|fromendpoint>
date <MMDDYYhhmm[ss]>
deviceport <Device Port # or Name>
exclusive <enable|disable>
ssh <IP Address or Name> [port <TCP Port>][<SSH flags>]
```

where `<SSH flags>` is one or more of:

```
user <Login Name>
version <1|2>
command <Command to Execute>
tcp <IP Address> [port <TCP Port>]
telnet <IP Address or Name> [port <TCP Port>]
trigger <now|datetime|chars>
```

If the trigger is `datetime` (establish connection at a specified date/time), enter the date parameter. If the trigger is `chars` (establish connection on receipt of a specified number or characters or a character sequence), enter the `charxfer` parameter and either the `charcount` or the `charseq` parameter.

```
udp <IP Address> [port <UDP Port>]
```

Description

Connects a device port to another device port or an outbound network connection (data flows in both directions).

connect direct

Syntax

```
connect direct <endpoint>
```

Parameters

Endpoint is one of:

```
deviceport <Device Port # or Name>
hostlist <Host List>
ssh <IP Address or Name> [port <TCP Port>][<SSH flags>]
```

where `<SSH flags> is one or more of:`

```
user <Login Name>
version <1|2>
command <Command to Execute>
tcp <IP Address> [port <TCP Port>]
telnet <IP Address or Name> [port <TCP Port>]
udp <IP Address> [port <UDP Port>
```

Description

Connects to a device port to monitor and/or interact with it, or establishes an outbound network connection.

connect listen deviceport

Syntax

```
connect listen deviceport <Device Port # or Name>
```

Description

Monitors a device port.

connect global outgoingtimeout

Syntax

```
connect global outgoingtimeout <disable|1-9999 seconds>
```

Description

Sets the amount of time the SLC will wait for a response (sign of life) from an SSH/Telnet server that it is trying to connect to.

Note: *This is not a TCP timeout.*

connect global show

Syntax

```
connect global show
```

Description

To display global connections.

connect terminate

Syntax

```
connect terminate <Connection ID>
```

Description

Terminates a bidirectional or unidirectional connection.

connect unidirection

Syntax

```
connect unidirection <Device Port # or Name> dataflow
<toendpoint|fromendpoint> <endpoint>
```

Parameters

Endpoint is one of:

`charcount <# of Chars>`

`charseq <Char Sequence>`

`datetime <MMDDYYhhmm[ss]>`

`deviceport <Port # or Name>`

`exclusive <enable|disable>`

`ssh <IP Address or Name> [port <TCP Port][<SSH flags>]`

where `<SSH flags>` is one or more of:

`user <Login Name>`

`version <1|2>`

`command <Command to Execute>`

`tcp <IP Address> [port <TCP Port>]`

`telnet <IP Address or Name> [port <TCP Port]`

`trigger <now|datetime|chars>`

If the trigger is `datetime` (establish connection at a specified date/time), enter the date parameter. If the trigger is `chars` (establish connection on receipt of a specified number or characters or a character sequence), enter either the `charcount` or the `charseq` parameter.

`udp <IP Address> [port <UDP Port>]`

Description

Connects a device port to another device port or an outbound network connection (data flows in one direction).

show connections

Syntax

```
show connections [email <Email Address>]
```

Description

Displays connections and their IDs. You can optionally email the displayed information.

The connection IDs are in the left column of the resulting table. The connection ID associated with a particular connection may change if the connection times out and is restarted.

show connections connid

Syntax

```
show connections connid <Connection ID> [email <Email Address>]
```

Description

Displays details for a single connection. You can optionally email the displayed information.

Console Port Commands

set consoleport

Syntax

```
set consoleport <one or more parameters>
```

Parameters

```
baud <300-115200>
databits <7|8>
flowcontrol <none|xon/xoff|rts/cts>
parity <none|odd|even>
showlines <enable|disable>
stopbits <1|2>
timeout <disable|1-30>
```

Description

Configures console port settings.

show consoleport

Syntax

```
show consoleport
```

Description

Displays console port settings.

Custom User Menu Commands

When creating a custom user menu, note the following limitations:

- Maximum of 20 custom user menus.
- Maximum of 50 commands per custom user menu (`logout` is always the last command).
- Maximum of 15 characters for menu names.
- Maximum of five nested menus can be called.
- No syntax checking. (Enter each command correctly.)

set localusers

Syntax

```
set localusers add|edit <User Login> menu <Menu Name>
```

Description

Assigns a custom user menu to a local user.

set menu add

Syntax

```
set menu add <Menu Name> [command <Command Number>]
```

Description

Creates a new custom user menu or adds a command to an existing custom user menu.

set menu edit

Syntax

```
set menu edit <Menu Name> <parameter>
```

Parameters

```
command <Command Number>
nickname <Command Number>
redisplaymenu <enable|disable>
shownicknames <enable|disable>
title <Menu Title>
```

Description

Changes a command within an existing custom user menu.

Changes a nickname within an existing custom user menu.

Enables or disables the redisplay of the menu before each prompt.

Enables or disables the display of command nicknames instead of commands.

Sets the optional title for a menu.

set menu delete

Syntax

```
set menu delete <Menu Name> [command <Command Number>]
```

Description

Deletes a custom user menu or one command within a custom user menu.

set <nis|ldap|radius|kerberos|tacacs+> custommenu

Syntax

```
set <nis|ldap|radius|kerberos|tacacs> custommenu <Menu Name>
```

Description

Sets a default custom menu for remotely authorized users.

show menu

Syntax

```
show menu <all|Menu Name>
```

Description

Displays a list of all menu names or all commands for a specific menu:

Date and Time Commands

set datetime

Syntax

```
set datetime <one date/time parameter>
```

Parameters

```
date <MMDDYYhhmm[ss]>
timezone <Time Zone>
```

Note: *If you type an invalid time zone, the system guides you through the process of selecting a time zone.*

Description

Sets the local date, time, and local time zone (one parameter at a time).

show datetime

Syntax

```
show datetime
```

Description

Displays the local date, time, and time zone.

set ntp

Syntax

```
set ntp <one or more ntp parameters>
```

Parameters

```
localserver1 <IP Address or Hostname>
localserver2 <IP Address or Hostname>
localserver3 <IP Address or Hostname>
poll <local|public>
publicserver <IP Address or Hostname>
```

`state <enable|disable>`

`sync <broadcast|poll>`

Description

Synchronizes the SLC with a remote time server using NTP.

show ntp

Syntax

`show ntp`

Description

Displays NTP settings.

Device Commands

set command

Syntax

`set command <Device Port # or Name or List> <one or more parameters>`

Parameters

`slp auth login <User Login>`
Establishes the authentication information to log into the SLP attached to the device port.

`slp restart`
Issues the CLI command the SLP uses to restart itself.

`slp outletcontrol state <on|off|cyclepower> [outlet <Outlet #>][tower <A|B>]`

Outlet # is 1-8 for SLP8 and 1-16 for SLP16.
The `outletcontrol` parameters control individual outlets.

`slp outletstate [outlet <Outlet #>]`
The `outletstate` parameter shows the state of all outlets or a single outlet.

`slp envmon`
Displays the environmental status (e.g., temperature and humidity) of the SLP.

slp infeedstatus
Displays the infeed status and load of the SLP.

`slp system`
Provides system information for the SLP.

`sensorsoft lowtemp <Low Temperature in C.>`
Sets the lowest temperature permitted for the port.

`sensorsoft hightemp <High Temperature in C.>`
Sets the hightest temperature permitted for the port.

`sensorsoft lowhumidity <Low Humidity %>`
Sets the lowest humidity pemitted for the port.

`sensorsoft highhumidity <High Humidity %>`
Sets the lowest humidity permitted for the port.

`sensorsoft traps <enable|disable>`
Enables or disables traps when specified conditions are met.

sensorsoft status
Displays the status of the port.

Description

Sends commands to (or control) a device connected to an SLC device port over the serial port.

Note: *Currently the only devices supported for this type of interaction are the SLP and Sensorsoft devices.*

Device Port Commands

set deviceport port

Syntax

`set deviceport port <Device Port List or Name> <one or more device port parameters>`

Example: `set deviceport port 2-5,6,12,15-16 baud 2400`

Parameters

`auth <`**`pap`**`|chap>`

`banner <Banner Text>`

`baud <300-115200>`

`breakseq <1-10 Chars>`

`calleridcmd <Modem Command String>`

`calleridlogging <enable|` **`disable`**`>`

`chaphost <CHAP Host or User Name>`

`chapsecret <CHAP Secret or User Password>`
The user defines the secret.

`checkdsr <enable|`**`disable`**`>`

`closedsr <enable|`**`disable`**`>`

`databits <7|`**`8`**`>`

`device <`**`none`**`|slp8|slp16>`

`dialbacknumber <usernumber|Phone Number>`

`dialinlist <Host List for Dial-in>`

`dialoutlogin <User Login>`

`dialoutnumber <Phone Number>`

`dialoutpassword <Password>`

`dodauth <pap|chap>`

`dodchaphost <CHAP Host or User Name>`

`dodchapsecret <CHAP Secret or User Password>`

`flowcontrol <`**`none`**`|xon/xoff|rts/cts>`

`gsmautodns <`**`enable`**`|disable>`

`gsmbearerservice <GSM Bearer Service>`

`gsmcompression <enable|`**`disable`**`>`

`gsmcontext <GPRS Context Id>`

gsmdialoutmode <**gprs**|gsm>

gsmpin <GSM/GPRS PIN Number>

idletimeout <disable|1-9999 seconds>

initscript <Initialization Script>
A script that initializes a modem.

Note: *We recommend preceding the initscript with* ***AT*** *and include* ***E1 V1 x4 Q0*** *so that the SLC may properly control the modem.*

ipaddr <IP Address>

localipaddr <negotiate|IP Address>

logins <enable|**disable**>

modemmode <**text**|ppp>

modemstate <**disable**|dialout|dialin|dialback|dialondemand|dialin+dialondemand>|dialinhostlist>

name <Port Name>

nat <enable|**disable**>

modemtimeout <disable|1-9999 seconds>

parity <**none**|odd|even>

remoteipaddr <negotiate|IP Address>

restartdelay <PPP Restart Delay>

slp infeedstatus
Displays the infeed status and load of the SLP.

showlines <enable|disable>

sshauth <**enable**|disable>

sshin <enable|**disable**>

sshport <TCP Port>

stopbits <**1**|2>

telnetauth <**enable**|disable>

telnetin <enable|**disable**>

telnetport <TCP Port>

timeoutlogins <**disable** or 1-30>

webcolumns <Web SSH/Telnet Cols>

webrows <Web SSH/Telnet Rows>

Description

Configures a single port or a group of ports.

set deviceport global

Syntax

set deviceport global <one or more parameters>

Parameters

sshport <TCP Port>

telnetport <TCP Port>

```
tcpport <TCP Port>
maxdirect <1-10>
```

Description

Configures settings for all or a group of device ports.

show deviceport global

Syntax

```
show deviceport global
```

Description

Displays global settings for device ports.

show deviceport names

Syntax

```
show deviceport names
```

Description

Displays a list of all device port names.

show deviceport port

Syntax

```
show deviceport port <Device Port List or Name>
```

Description

Displays the settings for one or more device ports.

show portcounters

Syntax

```
show portcounters [deviceport <Device Port List or Name>] [email <Email Address>]
```

Description

Displays device port statistics and errors for one or more ports. You can optionally email the displayed information.

show portcounters zerocounters

Syntax

```
show portcounters zerocounters <Device Port List or Name>
```

Description

Zeros the port counters for one or more device ports.

show portstatus

Syntax

```
show portstatus [deviceport <Device Port List or Name>] [email <Email Address>]
```

Description

Displays the modes and states of one or more device port(s). You can optionally email the displayed information.

Diagnostic Commands

diag arp

Syntax

```
diag arp [email <Email Address>]
```

Description

Displays the ARP table of IP address-to-hardware address mapping. You can optionally email the displayed information.

diag internals

Syntax

```
diag internals
```

Description

Displays information on the internal memory, storage and processes of the SLC

Note: *This command is available in the CLI but not the web.*

diag netstat

Syntax

```
diag netstat [protocol <all|tcp|udp>] [email <Email Address>]
```

Description

To display a report of network connections. You can optionally email the displayed information.

diag nettrace

Syntax

```
diag nettrace <one or more parameters>
```

Parmeters

```
ethport <1|2>
host <IP Address or Name>
numpackets <Number of Packets>
protocol <tcp|udp|icmp>
verbose <enable|disable>
```

Description

Displays all network traffic, applying optional filters. This command is not available on the web page.

diag lookup

Syntax

```
diag lookup <Hostname> [email <Email Address>]
```

Description

Resolves a host name into an IP address. You can optionally email the displayed information.

diag loopback

Syntax

```
diag loopback <Device Port Number or Name>[<parameters>]
```

Parameters

`test <internal|external>`

xferdatasize <Size In Kbytes to Transfer>
Default is **1** Kbyte.

Description

Tests a device port by transmitting data out the port and verifying that it is received correctly.

A special loopback cable comes with the SLC. To test a device port, plug the cable into the device port and run this command. The command sends the specified Kbytes to the device port and reports success or failure. The test is performed at 9600 baud. Only an external test requires a loopback cable.

diag traceroute

Syntax

```
diag traceroute <IP Address or Hostname>
```

Description

Displays the route that packets take to get to a network host:

Add “diag internals” command

End Device Commands

set command

Syntax

```
set command <Device Port # or Name or List> <one or more parameters>
```

Parameters

`slp auth login <User Login>`
Establishes the authentication information to log into the SLP attached to the device port.

`slp envmon`
Displays the environmental status (e.g., temperature and humidity) of the SLP.

`slp outletcontrol state <on|off|cyclepower> [outlet <Outlet #>]`
Outlet # is 1-8 for SLP8 and 1-16 for SLP16. The `outletcontrol` parameters control individual outlets.

`slp outletstate [outlet <Outlet #>]`
Shows the state of all outlets or a single outlet.

`slp restart`
Issues the CLI command the SLP uses to restart itself.

`slp system`
Displays system information for the SLP.

Description

Sends commands to (or controls) a device connected to an SLC device port over the serial port.

Note: *Currently the only devices supported for this type of interaction are the SLP and Sensorsoft devices.*

Events Commands

admin events add

Syntax

```
admin events add <trigger> <response>
```

<trigger> is one of:

```
|receivetrap|templimit|humidlimit|overcurrent|
```

<response> is one of:

```
action <syslog>

action <fwdalltrapseth|fwdseltrapeth> ethport <1|2> nms
<SNMP NMS> community <SNMP Community> [oid <SNMP OID>]

action <fwdalltrapsmodem|fwdseltrapmodem> deviceport <Device
Port # or Name> nms <SNMP NMS> community <SNMP Community>
[oid <SNMP Trap OID>]

action <fwdalltrapsmodem|fwdseltrapmodem> pccardslot
<upper|lower> nms <SNMP NMS> community <SNMP Community> [oid
<SNMP Trap OID>]


action <emailalert> emailaddress <destination email address>
```

Description

Manages the response to events that occur in the SLC.

admin events delete

Syntax

```
admin events delete <Event ID>
```

Description

Deletes an event definition.

admin events edit

Syntax

```
admin events edit <Event ID> <parameters>
```

Parameters

```
community <SNMP Community>
deviceport <Device Port # or Name>
ethport <1|2>
nms <SNMP NMS>
oid <SNMP Trap OID>
pccardslot <upper|lower>
emailaddress <destination email address>
```

Description

Edits event definitions.

admin events show

Syntax

```
admin events show
```

Description

Displays event definitions.

Host List Commands

set hostlist add|edit <Host List Name>

Syntax

```
set hostlist add|edit <Host List Name> [<parameters>]
```

Parameters:

```
name <Host List Name> (edit only)
retrycount <1-10>
```

Default is 3.

```
auth <enable|disable>
```

Description

Configures a prioritized list of hosts to be used for modem dial-in connections.

set hostlist add|edit <Host List Name> entry

Syntax

```
set hostlist add|edit <Host List Name> entry <Host Number>
[<parameters>]
```

Parameters:

```
host <IP Address or Name>
protocol <ssh|telnet|tcp>
```

```
port <TCP Port>
escapeseq <1-10 Chars>
```

Description

Adds a new host entry to a list or edit an existing entry.

set hostlist edit <Host List Name> move

Syntax

```
set hostlist edit <Host List Name> move <Host Number> position <Host Number>
```

Description

Moves a host entry to a new position in the host list.

set hostlist delete

Syntax

```
set hostlist delete <Host List> [entry <Host Number>]
```

Description

Deletes a host list, or a single host entry from a host list.

show hostlist

Syntax

```
show hostlist <all|names|Host List Name>
```

Description

Displays the members of a host list.

IP Filter Commands

set ipfilter state

Syntax

```
set ipfilter state
```

Description

Enables or disables IP filtering for incoming network traffic.

set ipfilter mapping

Syntax

```
set ipfilter mapping <parameters>
```

Parameters

```
ethernet <1|2> state <disable>
ethernet <1|2> state <enable> ruleset <Ruleset Name>
deviceport <1..48> state <disable>
deviceport <1..48> state <enable> ruleset <Ruleset Name>
pccardslot <upper|lower> state <disable>
pccardslot <upper|lower> state <enable> ruleset <Ruleset Name>
```

Description

Maps an IP filter to an interface.

set ip filter rules

Syntax

```
set ipfilter rules <parameters>
```

Parameters

```
add <Ruleset Name>
delete <Ruleset Name>

edit <Ruleset Name> <Edit Parameters>
```

Edit Parameters:

```
      append
      insert <Rule Number>
      replace <Rule Number>
delete <Rule Number>
```

Description

Sets IP filter rules.

Logging Commands

set deviceport port

Syntax

```
set deviceport port <Device Port List or Name> <one or more deviceport parameters>
```

Parameters

emaildelay <Email Delay>

emaillogging <**disable**|bytecnt|charstr>

emailrestart <Restart Delay>

emailsend <**email**|trap|both>

emailstring <Regex String>

emailsubj <Email Subject>

emailthreshold <Byte Threshold>

emailto <Email Address>

filedir <Logging Directory>

filelogging <enable|**disable**>

filemaxfiles <Max # of Files>

filemaxsize <Max Size of Files>

locallogging <enable|**disable**>

name <Device Port Name>

nfsdir <Logging Directory>

nfslogging <enable|**disable**>

nfsmaxfiles <Max # of Files>

nfsmaxsize <Size in Bytes>

pccardlogging <enable|**disable**>

pccardmaxfiles <Max # of Files>

pccardmaxsize <Size in Bytes>

pccardslot <**upper**|lower>

sysloglogging <enable|**disable>**

Description

Configures logging settings for one or more device ports.

Local logging must be enabled for a device port for the `locallog` commands to be executed. To use the `set locallog clear` command, the user must have permission to clear port buffers (see *11: User Authentication*).

Example

```
set deviceport port 2-5,6,12,15-16 baud 2400 locallogging enable
```

show locallog

Syntax

```
show locallog <Device Port # or Name> [bytes <Bytes To Display>]
```

Description

Displays a specific number of bytes of data for a device port. **1**K is the default.

set locallog clear

Syntax

```
set locallog clear <Device Port # or Name>
```

Description

Clears the local log for a device port.

The `locallog` commands can only be executed for a device port if local logging is enabled for the port. The `set locallog clear` command can only be executed if the user has permission to clear port buffers (see *11: User Authentication*).

Network Commands

set network

Syntax

```
set network <parameters>
```

Parameters

`interval <1-99999 Seconds>`

`ipforwarding <enable|`**`disable`**`>`

`probes <Number of Probes>`

`startprobes <1-99999 Seconds>`

Description

Sets TCP Keepalive and IP Forwarding network parameters.

set network dns

Syntax

```
set network dns <1|2|3> ipaddr <IP Address>
```

Description

Configures up to three DNS servers.

set network gateway

Syntax

```
set network gateway <parameters>
```

Parameters

`default <IP Address>`

`precedence <`**`dhcp`**`|gprs|default>`

```
alternate <IP Address>
pingip <IP Address>
ethport <1 or 2>
pingdelay <1-250 seconds>
failedpings <1-250>
```

Description

Sets default and alternate gateways. The alternate gateway is used if an IP address usually accessible through the default gateway fails to return one or more pings.

set network host

Syntax

```
set network host <Hostname> [domain <Domain Name>]
```

Description

Sets the SLC host name and domain name.

set network port

Syntax

```
set network port <1|2> <parameters>
```

Parameters

```
mode <auto|10mbit-half|100mbit-half|10mbit-full|100mbit-full>
state <dhcp|bootp|static|disable>
[ipaddr <IP Address> mask <Mask>]
[ipv6addr <IP v6 Address/Prefix>]
```

Description

Configures Ethernet port 1 or 2.

show network dns

Syntax

```
show network dns
```

Description

Displays DNS settings.

show network gateway

Syntax

```
show network gateway
```

Description

Displays gateway settings.

show network host

Syntax

```
show network host
```

Description

Displays the network host name of the SLC.

show network port

Syntax

```
show network port <1|2>
```

Description

Displays Ethernet port settings and counters.

show network all

Syntax

```
show network all
```

Description

Displays all network settings.

NFS and SMB/CIFS Commands

set nfs mount

Syntax

```
set nfs mount <one or more parameters>
```

Parameters

`locdir <Directory>`

`mount <enable|disable>`

`remdir <Remote NFS Directory>`

`rw <enable|disable>`
`Enables or disables` read/write access to remote directory.

Description

Mounts a remote NFS share.

The `remdir` and `locdir` parameters are required, but if they have been specified previously, you do not need to provide them again.

set nfs unmount

Syntax

```
set nfs unmount <1|2|3>
```

Description

Unmounts a remote NFS share.

set cifs

Syntax

```
set cifs <one or more parameters>
```

Parameters

```
eth1 <enable|disable>
eth2 <enable|disable>
state <enable|disable>
workgroup <Windows workgroup>
```

Description

Configures the SMB/CIFS share, which contains the system and device port logs.

Note: *The `admin config` command saves SLC configurations on the SMB/CIFS share.*

set cifs password

Syntax

```
set cifs password
```

Description

Changes the password for the SMB/CIFS share login (default is **cifsuser**).

show cifs

Syntax

```
show cifs
```

Description

Displays SMB/CIFS settings.

show nfs

Syntax

```
show nfs
```

Description

Displays NFS share settings.

PC Card Commands

PC Card Storage Commands

pccard storage copy

Syntax

```
pccard storage copy <upper|lower> file <Filename> newfile <New Filename>
```

Description

Copies a file on a Compact Flash card.

pccard storage delete

Syntax

```
pccard storage delete <upper|lower> file <Current Filename>
```

Description

Removes a file on a Compact Flash card.

pccard storage dir

Syntax

```
pccard storage dir <upper|lower>
```

Description

Views a directory listing of a Compact Flash card.

pccard storage format

Syntax

```
pccard storage format <upper|lower> [filesystem <ext2|fat>]
```

Description

Formats a Compact Flash card.

pccard storage mount

Syntax

```
pccard storage mount <upper|lower>
```

Description

Mounts a Compact Flash card in the SLC for use as a storage device. The Compact Flash card must be formatted with an ext2 or FAT file system before you mount it.

pccard storage rename

Syntax

```
pccard storage rename <upper|lower> file <Filename> newfile <New Filename>
```

Description

To rename a file on a Compact Flash card.

pccard storage unmount

Syntax

```
pccard storage unmount <upper|lower>
```

Description

Unmounts a Compact Flash card. Enter this command before ejecting the card.

PC Card Modem Commands

pccard modem

Syntax

pccard modem <upper|lower> <parameters>

Parameters

auth <**pap**|chap>

baud <300-115200>
9600 is the default.

calleridcmd <Modem Command String>

calleridlogging <enable| **disable**>

chaphost <CHAP Host or User Password>

chapsecret <CHAP Secret or User Password>

databits <7|**8**>

dialbacknumber <usernumber|Phone Number>

dialinlist <Host List for Dial-in>

dialoutlogin <User Login>

dialoutnumber <Phone Number>

dodauth <pap|chap>

dodchaphost <CHAP Host or User Name>

dodchapsecret <CHAP Secret or User Password>

dialoutpassword <Password>

flowcontrol <**none**|xon/xoff|rts|cts>

gsmautodns <**enable**|disable>

gsmbearerservice <GSM Bearer Service>

gsmcompression <enable|**disable**>

gsmcontext <GPRS Context Id>

gsmdialoutmode <**gprs**|gsm>

gsmpin <GSM/GPRS PIN Number>

idletimeout <disable|1-9999 seconds>

initscript <Initialization Script>

isdnchannel <1|2>

isdnnumber <Phone Number>

localipaddr <negotiate|IP Address>

modemmode <**text**|ppp>

modemstate <**disable**|dialout|dialin|dialback|dialondemand|
dialin+dialondemand> <dialinhostlist>

modemtimeout <disable|1-9999 sec>

parity <**none**|odd|even>

remoteipaddr <negotiate|IP Address>

restartdelay <PPP Restart Delay>

```
service <none|telnet|ssh|tcp>
sshauth <enable|disable>
sshport <TCP Port>
stopbits <1|2>
tcpauth <enable|disable>
tcpport <TCP Port>
telnetauth <enable|disable>
telnetport <TCP Port>
timeoutlogins <disable|1-30>
```

Description

Configures a currently loaded PC Card.

Routing Commands

set routing

Syntax

```
set routing [parameters]
```

Parameters

```
rip <enable|disable>
route <1-64> ipaddr <IP Address> mask <Netmask> gateway <IP Address>
static <enable|disable>
version <1|2|both>
```

Description

Configures static or dynamic routing.

To delete a static route, set the IP address, mask, and gateway parameters to **0.0.0.0**.

show routing

Syntax

```
show routing [resolveip <enable|disable>] [email <Email Address>]
```

Description

Sets the routing table to display IP addresses (disable) or the corresponding host names (enable). You can optionally email the displayed information.

Services Commands

set services

Syntax

```
set services <one or more services parameters>
```

Parameters

```
alarmdelay <1-6000 Seconds>
```

auditlog <enable|**disable**>

auditsize <Size in Kbytes>
Limit is 1-500 Kbytes

authlog <off|error|warning|info|debug>

clicommands <enable|**disable**>

contact <Admin contact info>

devlog <off|error|warning|info|debug>

diaglog <off|error|warning|info|debug>

genlog <off|error|warning|info|debug>

includesyslog <enable|**disable**>

location <Physical Location>

netlog <off|error|warning|info|debug>

nms <IP Address or Name>

phonehome <**enable**|disable>

phoneip <IP Address>

portssh <TCP Port>

rocommunity <Read-Only Community Name>

rwcommunity <Read-Write Community Name>
Sets a password for an SNMP manager to access the read-only data the SLC SNMP agent provides and to modify data where permitted.

servlog <off|error|warning|info|debug>

smtpserver <IP Address or Hostname>

snmp <enable|**disable**>

ssh <**enable**|disable>

syslogserver1 <IP Address or Name>

syslogserver2 <IP Address or Name>

telnet <enable|**disable**>

timeoutssh <**disable** or 1-30>

timeouttelnet <**disable** or 1-30>

traps <enable|**disable**>

trapcommunity <Trap Community>

v1ssh <**enable**|disable>

v3password <Password for v3 auth>

v3user <User for v3 auth>

v3user <V3 RO User>

v3password <V3 RO User Password>

v3phrase <V3 RO User Passphrase>

v3rwuser <V3 RW User>

v3rwpassword <V3 RW User Password>

v3rwphrase <V3 RW User Passphrase>

v3security <noauth|auth|authencrypt>

```
v3auth <md5|sha>
v3encrypt <des|aes>
webssh <enable|disable
webtelnet <enable|disable>
```

Description

Configures services (system logging, SSH and Telnet access, SSH and Telnet timeout, SNMP agent, email (SMTP) server, and audit log):

show services

Syntax

```
show services
```

Description

Displays current services.

SLC Network Commands

set slcnetwork

Syntax

```
set slcnetwork <one or more parameters>
```

Parameters

```
add <IP Address>
delete <IP Address>
search <localsubnet|ipaddrlist|both>
```

Description

Detects and displays all SLC or user-defined IP addresses on the local network.

show slcnetwork

Syntax

```
show slcnetwork[ipaddrlist <all|Address Mask>]
```

Description

Detects and displays all SLCs on the local network.

Without the `ipaddrlist` parameter, the command searches the SLC network. With the `ipaddrliist` parameter, the command displays a sorted list of all IP addresses or displays the IP addresses that match the mask (for example, 172.19.255.255 would display all IP addresses that start with 172.19).

SSH Key Commands

set sshkey allexport

Syntax

```
set sshkey allexport <ftp|scp|copypaste> [pubfile <Public Key File>]
[host <IP Address or Name>] [login <User Login>] [path <Path to Copy
Keys>]
```

Parameter

Exports the public keys of all previously created SSH keys.

set sshkey delete

Syntax

```
set sshkey delete <one or more parameters>
```

Parameters

```
keyhost <SSH Key Host>

keyname <SSH Key Name>
keyuser <SSH Key User>
```

Description

Deletes an ssh key.

Specify the `keyuser` and `keyhost` to delete an imported key; specify the `keyuser` and `keyname` to delete exported key.

set sshkey export

Syntax

```
set sshkey export <ftp|scp|copypaste> <one or more parameters>
```

Parameters

```
[format <openssh|secsh>]

[host <IP Address or Name>]

[login <User Login>]

[path <Path to Copy Key>]

bits <512|1024>

keyname <SSH Key Name>

keyuser <SSH Key User>

type <rsa|dsa>
```

Description

Exports an sshkey.

set sshkey import

```
set sshkey import <ftp|scp> <one or more parameters>
```

Parameters

```
[keyhost <SSH Key IP Address or Name>]
```

```
[keyuser <SSH Key User>]
[path <Path to Public Key File>]
file <Public Key File>
host <IP Address or Name>
login <User Login>
```

Description

Imports an SSH key.

set sshkey server import

Syntax

```
set sshkey server import type <rsa1|rsa|dsa> via <sftp|scp>
      pubfile <Public Key File> privfile <Private Key File>
      host <IP Address or Name> login <User Login> [path <Path to Key
      File>]
```

Description

Imports an SLC host key.

set sshkey server reset

Syntax

```
set sshkey server reset [type <all|rsa1|rsa|dsa>]
```

Description

Resets defaults for all or selected host keys.

show sshkey export

Syntax

```
show sshkey export <one or more parameters>
```

Parameters

```
[keyhost <SSH Key IP Address or Name>]
[keyuser <SSH Key User>]
[viewkey <enable|disable>]
```

Description

Displays all exported keys or keys for a specific user, IP address, or name.

show sshkey import

Syntax

```
show sshkey import <one or more parameters>]
```

Parameters

```
[keyhost <SSH Key IP Address or Name>]
[keyuser <SSH Key User>]
```

```
[viewkey <enable|disable>]
```

Description

Displays all keys that have been imported or keys for a specific user, IP address, or name.

show sshkey server

Syntax

```
show sshkey server [type <all|rsa1|rsa|dsa>]
```

Description

Displays host keys (public key only).

Status Commands

show connections

Syntax

```
show connections [email <Email Address>]
```

Description

Displays a list of current connections. Optionally emails the displayed information. The connection IDs are in the left column of the resulting table. The connection ID associated with a particular connection may change if the connection times out and is restarted.

show connections connid

Syntax

```
show connections connid <Connection ID> [email <Email Address>].
```

Description

Provides details, for example, endpoint parameters and trigger, for a specific connection. Optionally emails the displayed information.

Note: Use the basic `show connections` command to obtain the Connection ID.

show portcounters

Syntax

```
show portcounters [deviceport <Device Port List or Name>] [email <Email
Address>]
```

Description

Generates a report for one or more ports. Optionally emails the displayed information.

show portstatus

Syntax

```
show portstatus [deviceport <Device Port List or Name>] [email <Email
Address>]
```

Description

Displays device port modes and states for one or more ports. Optionally emails the displayed information.

show sysconfig

Syntax

```
show sysconfig [display <basic|auth|devices>] [email <Email Address]
```

Description

Displays a snapshot of all configurable parameters. Optionally emails the displayed information.

show sysstatus

Syntax

```
show sysstatus [email <Email Address>]
```

Description

To display the overall status of all SLC devices. Optionally emails the displayed information.

System Log Commands

show syslog

Syntax

```
show syslog [<parameters>]
```

Parameters

```
[email <Email Address>]
level <error|warning|info|debug>
log <all|netlog|servlog|authlog|devlog|diaglog|genlog>
display <head|tail> [numlines <Number of Lines>]
starttime <MMDDYYhhmm[ss]>
endtime <MMDDYYhhmm[ss]>
```

Description

Displays the system logs containing information and error messages.

Note: *the level and display parameters cannot be used simultaneously.*

show syslog clear

Syntax

```
show syslog clear <all|netlog|servlog|authlog|devlog|diaglog|genlog>
```

Description

Clears one or all of the system logs.

A: Bootloader

The SLM provides a bootload command interface. This interface is only accessible through the SLC's console port.

Accessing the Bootloader

To access the bootloader CLI:

1. Power up the SLC.
2. Type **x15** within 10 seconds of power up. The bootloader halts the boot procedure and displays a **Lantronix** command prompt.

Bootloader Commands

User Commands

`help`

Lists and prints the command list and online help.

`?`

An alias for `help`.

`boot`

Boot default (runs `bootcmd`).

`bootcheck`

Checks boot bank information.

`bootinfo`

Displays boot bank information.

`bootsel 1|2`

Selects boot bank 1 or boot bank 2.

`IDE`

Accesses the IDE sub-system.

mtest

Performs a simple test of the RAM.

showconf

Displays hardware configuration.

su cust|admin

Switches to another user: from `cust` (customer) to `adm` (administrator) and vice versa.

version

Prints the bootloader version.

whoami

Displays information about the current user.

Administrator Commands

In addition to the commands that the user can issue, the administrator can issue the following commands:

imagecopy

Copies an image of the drive from the lower PCMCIA device to the internal CF card.

passwd

Provides a new password for user `admin`. The default password for user `admin` is `admin.` User `cust` does not have a password.

ping

Sends a ping request to the network host.

printeny

Prints bootloader variables.

setenv

Sets environment variables.

showconf

Displays hardware configuration parameters.

B: Security Considerations

The SLC provides data path security by means of SSH or Web/SSL. Even with the use of SSH/SSL, however, do not assume you have complete security. Securing the data path is only one measure needed to ensure security. This appendix briefly discusses some important security considerations.

Security Practice

Develop and document a Security Practice. The Security Practice should state:

- The dos and don'ts of maintaining security. For example, the power of SSH and SSL is compromised if users leave sessions open or advertise their password.
- The assumptions that users can make about the facility and network infrastructure, for example, how vulnerable the CAT 5 wiring is to tapping.

Factors Affecting Security

External factors affect the security provided by the SLC, for example:

- Telnet sends the login exchange as clear text across Ethernet. A person snooping on a subnet may read your password.
- A terminal to the SLC may be secure, but the path from the SLC to the end device may not be secure.
- With the right tools, a person having physical access to open the SLC may be able to read the encryption keys.
- There is no true test for a denial-of-service attack—there is always a legitimate scenario for a request storm. A denial-of-service filter locks out some high-performance automated/scripted requests. The SLC will attempt to service all requests and will not filter out potential denial–of-service attacks.

C: Safety Information

Safety Precautions

Please follow the safety precautions described below when installing and operating the SLC.

Cover

- Do not remove the cover of the chassis. There are no user-serviceable parts inside. Opening or removing the cover may expose you to dangerous voltage that could cause fire or electric shock.
- Refer all servicing to Lantronix.

Power Plug

- When disconnecting the power cable from the socket, pull on the plug, not the cord.
- Always connect the power cord to a properly wired and grounded power source. Do not use adapter plugs or remove the grounding prong from the cord.
- Only use a power cord with a voltage and current rating greater than the voltage and current rating marked on the unit.
- Install the unit near an AC outlet that is easily accessible.
- Always connect any equipment used with the product to properly wired and grounded power sources.
- To help protect the product from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- Do not connect or disconnect this product during an electrical storm.

Input Supply

- This unit may have more than one power supply source. Disconnect all power supply sources before servicing to avoid electric shock.
- Check nameplate ratings to assure there is no overloading of supply circuits that could affect over current protection and supply wiring.

Grounding

- Maintain reliable grounding of this product.
- Pay particular attention to supply connections when connecting to power strips, rather than directly to the branch circuit.
- Install DC-rated equipment only under the following conditions:
  - Connect the equipment to a DC supply source that is electrically isolated from the AC source and reliably connected to ground, or connect it to a DC (SELV) source.

- Install only in restricted access areas (dedicated equipment rooms, equipment closets or the like) in accordance with Articles 110-16, 110-17, and 110-18 of the National Electrical Code, ANSI/NFPA 70.
- Route and secure input wiring to terminal block in such a manner that it is protected from damage and stress. Do not route wiring past sharp edges or moving parts.
- Incorporate a readily accessible disconnect device, with a 3 mm minimum contact gap, in the fixed wiring.
- Provide a listed circuit breaker suitable for protection of the branch circuit wiring and rated 60 VDC minimum.

Fuses

- For protection against fire, replace the power-input-module fuse with the same type and rating.

Rack

If rack mounted units are installed in a closed or multi-unit rack assembly, they may require further evaluation by Certification Agencies. The following items must be considered:

- Do **not** install the unit in a rack in such a way that a hazardous stability condition results because of uneven loading. A drop or fall could cause injury.
- The ambient temperature (Tma) inside the rack may be greater than the room ambient temperature. Make sure to install the SLC in an environment with an ambient temperature less than the maximum operating temperature of the SLC. (See *Technical Specifications* on page 20.)
- Install the equipment in a rack in such a way that the amount of airflow required for safe operation of the equipment is not compromised.
- Mount the equipment in the rack so that a hazardous condition is not achieved due to uneven mechanical loading.
- Maintain reliable earthing of rack-mounted equipment. Give particular attention to supply connections other than direct connections to the branch circuit (e.g. use of power strips).
- Before operating the SLC, make sure the SLC is secured to the rack.

Port Connections

- Only connect the network port to an Ethernet network that supports 10Base-T/100Base-T.
- Only connect device ports to equipment with serial ports that support EIA-232 (formerly RS-232C).
- Only connect the console port to equipment with serial ports that support EIA-232 (formerly RS-232C).

D: Adapters and Pinouts

The serial device ports of the SLC products match the RJ45 pinouts of the console ports of many popular devices found in a network environment. The SLC uses conventional straight-through Category 5 fully pinned network cables for all connections when used with Lantronix adapters. The cables are available in various lengths.

In most cases, you will need an adapter for your serial devices. Lantronix offers a variety of RJ45-to-serial connector adapters for many devices. These adapters convert the RJ45 connection on the SLC to a 9-pin or 25-pin serial connector found on other manufacturers' serial devices or re-route the serial signals for connections to other devices that use RJ45 serial connectors.

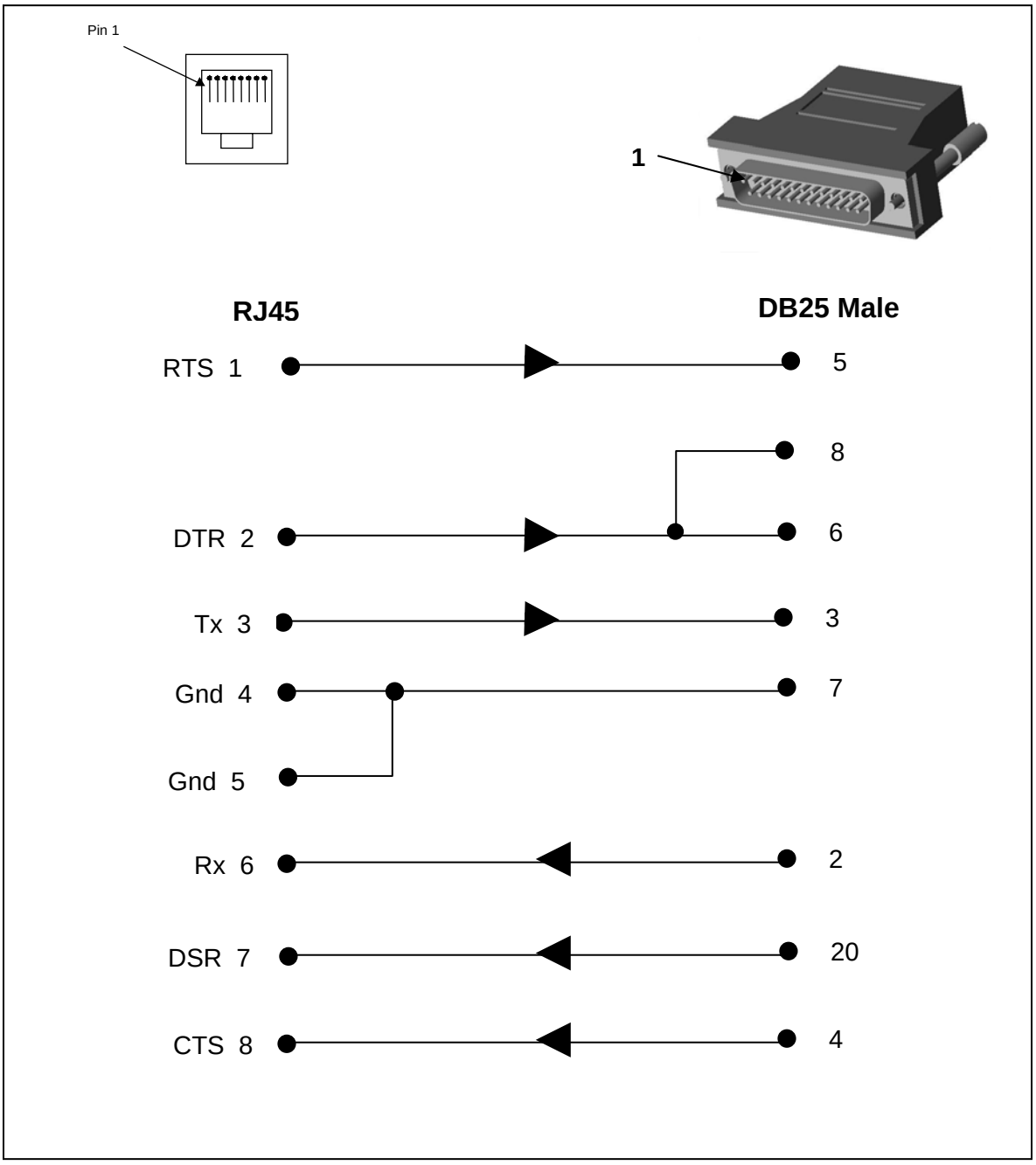
Please check the cabling database on the Lantronix website at http://www.lantronix.com for suggested cables and adapters for commonly used serial devices.

The console port is wired the same way as the device ports and has the same signal options.

Note: *You can view or change the console port settings using the LCDs and pushbuttons on the front panel, the Console Port web page, or the command line interface* ***show console port*** *and* ***set consoleport*** *commands.*

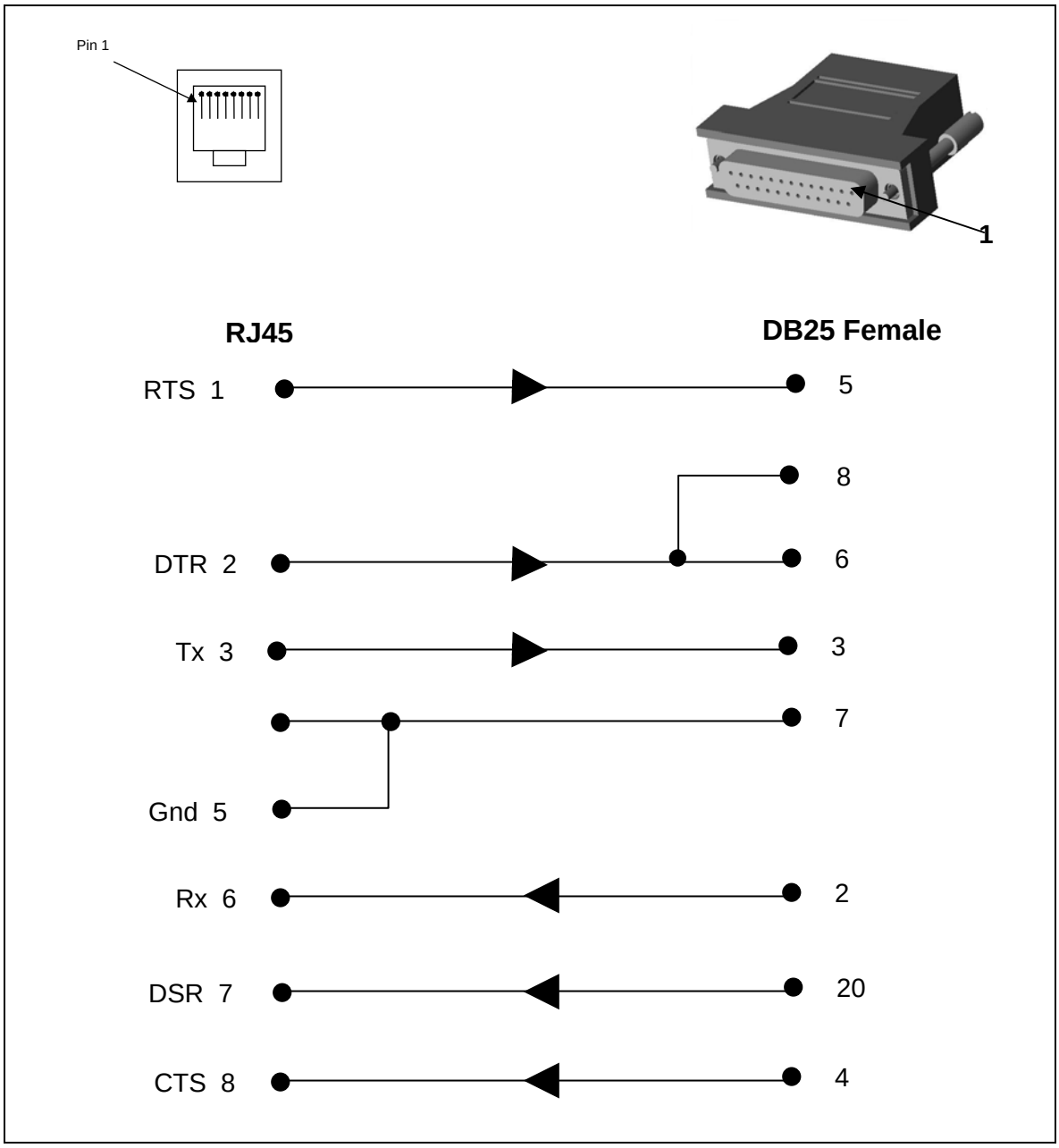
The adapters illustrated below are compatible with the Lantronix SLC models.

RJ45 Receptacle to DB25M DCE Adapter for the SLC (PN 200.2066A)

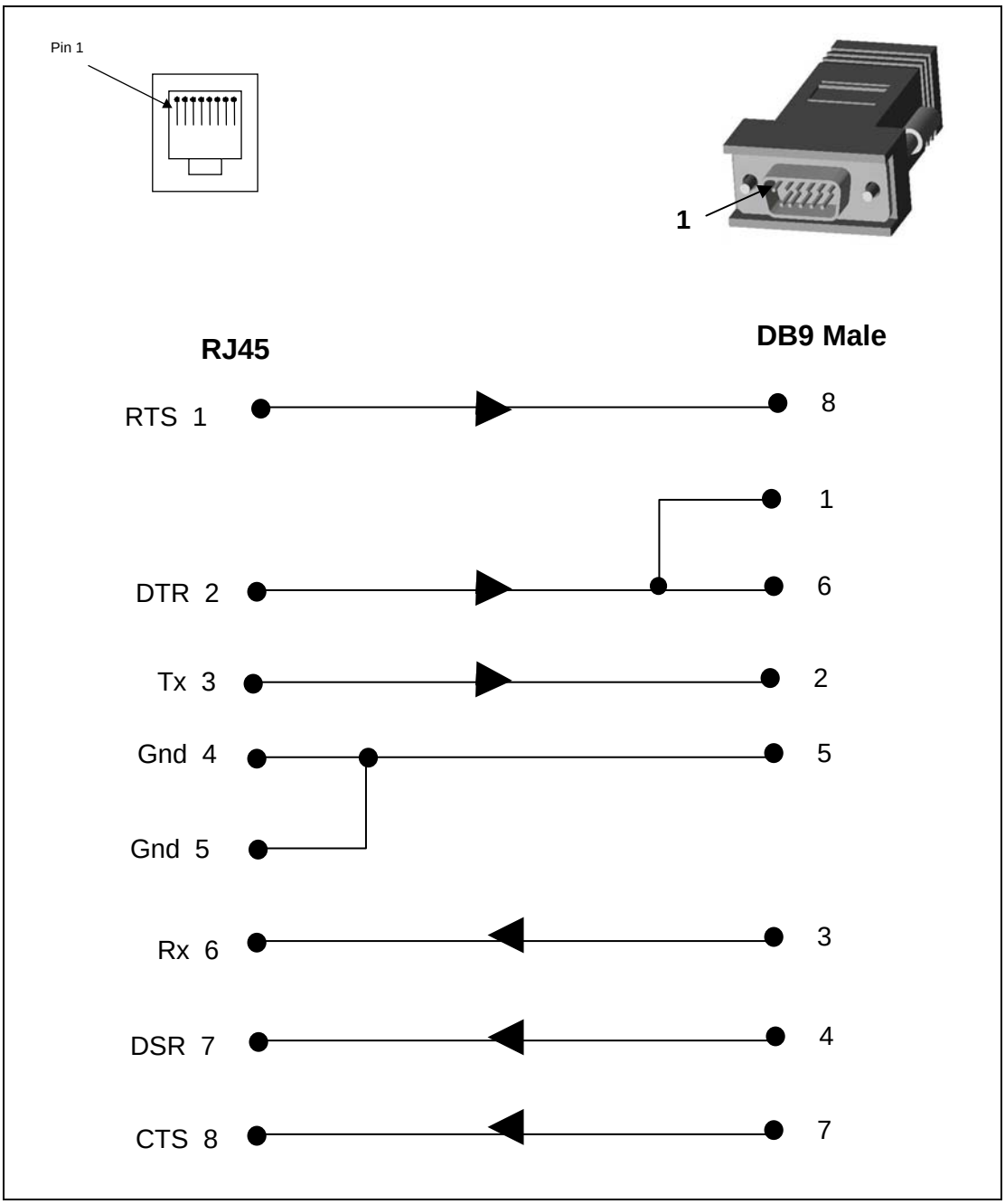


Use PN 200.2066A adapter with a dumb terminal or with many SUN applications.

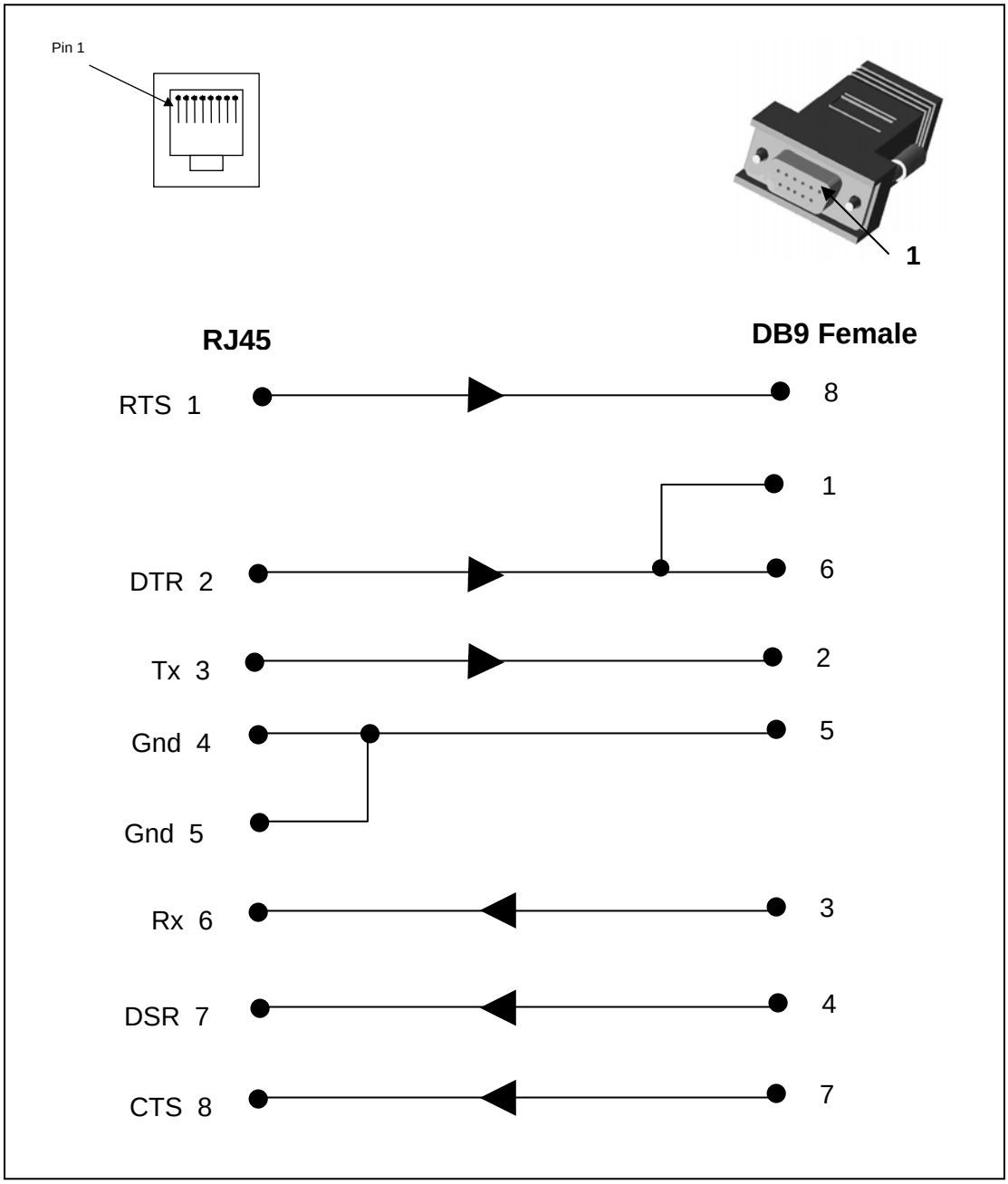
RJ45 Receptacle to DB25F DCE Adapter for the SLC (PN 200.2067A)



RJ45 Receptacle to DB9M DCE Adapter for the SLC (PN 200.2069A)



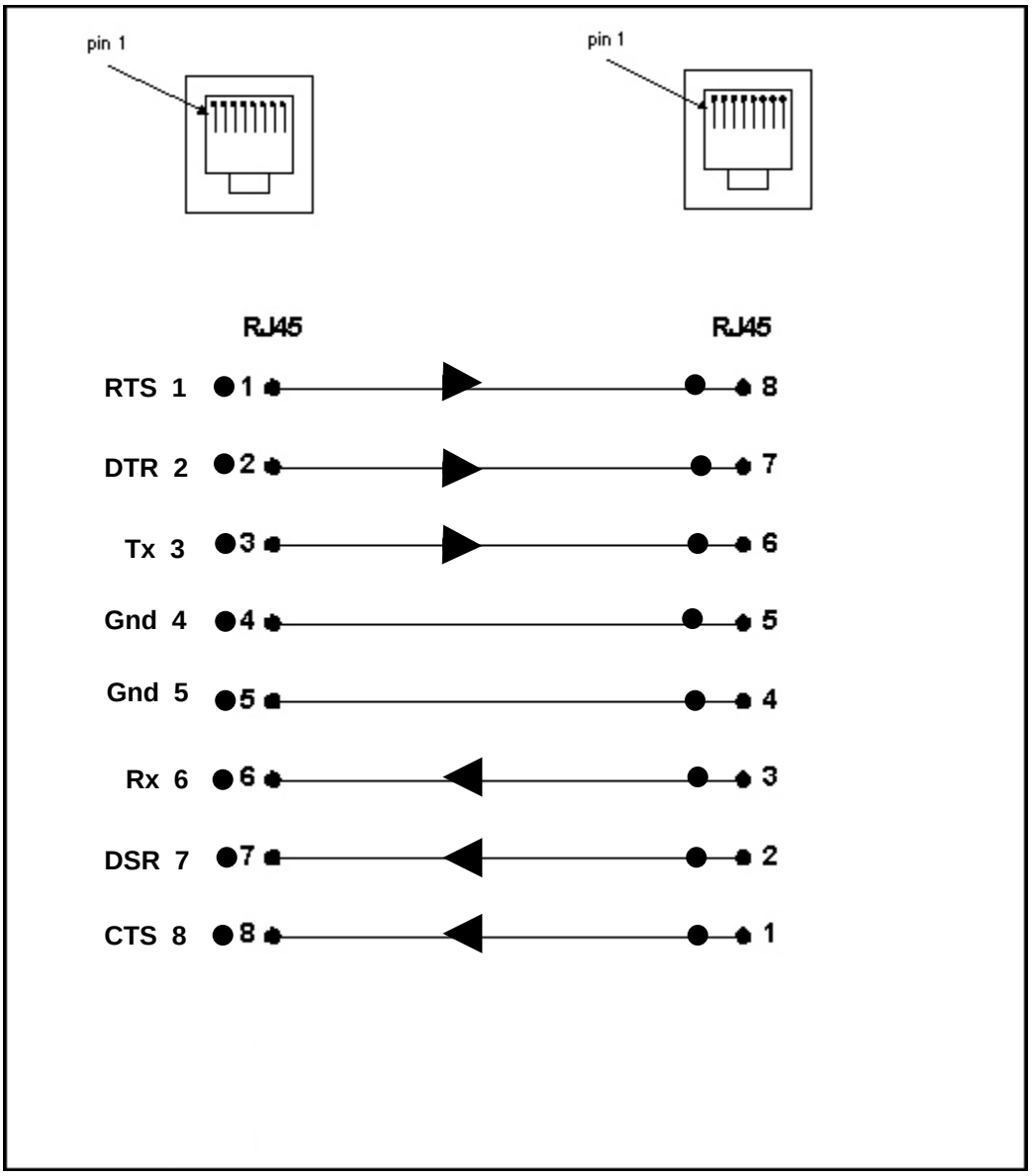
RJ45 Receptacle to DB9F DCE Adapter for the SLC (PN 200.2070A)



Use PN 200.2070A adapter with a PC's serial port.

RJ45 to RJ45 Adapter for Netra/Sun/Cisco and SLP (PNs 200.2225 and ADP010104-01)

Note: *The cable ends of the ADP010104-01 are an RJ45 socket on one end and a RJ45 plug on the other instead of RJ45 sockets on both ends.*



Use this adapter for SLP Remote Power Manager, Netra/SUN/CISCO, and others.

E: Protocol Glossary

BOOTP (Bootstrap Protocol)

Similar to DHCP, but for smaller networks. Automatically assigns the IP address for a specific duration of time.

CHAP (Challenge Handshake Authentication Protocol)

A secure protocol for connecting to a system; it is more secure than the PAP.

DHCP (Dynamic Host Configuration Protocol)

Internet protocol for automating the configuration of computers that use TCP/IP.

DNS (Domain Name Servers): A system that allows a network nameserver to translate text host names into numeric IP addresses.

Kerberos

A network authentication protocol that provides strong authentication for client/server applications by using secret-key cryptography.

LDAP (Lightweight Directory Access Protocol)

A protocol for accessing directory information.

NAT (Network Address Translation)

An Internet standard that enables a LAN to use one set of IP addresses for internal traffic and a second set of addresses for external traffic. This enables a company to shield internal addresses from the public Internet.

NFS (Network File System)

A protocol that allows file sharing across a network. Users can view, store, and update files on a remote computer. You can use NFS to mount all or a portion of a file system. Users can access the portion mounted with the same privileges as the user's access to each file.

NIS (Network Information System)

System developed by Sun Microsystems for distributing system data such as user and host names among computers on a network.

NMS (Network Management System)

NMS acts as a central server, requesting and receiving SNMP-type information from any computer using SNMP.

NTP (Network Time Protocol)

A protocol used to synchronize time on networked computers and equipment.

PAP (Password Authentication Protocol)

A method of user authentication in which the username and password are transmitted over a network and compared to a table of name-password pairs.

PPP (Point-to-Point Protocol)

A protocol for creating and running IP and other network protocols over a serial link.

RADIUS (Remote Authentication Dial-In User Service)

An authentication and accounting protocol. Enables remote access servers to communicate with a central server to authenticate dial-in users and their access permissions. A company stores user profiles in a central database that all remote servers can share.

SMB/CIFS

(Server Message Block/Common Internet File System): Microsoft's protocol for allowing all applications as well as Web browsers to share files across the Internet. CIFS runs on TCP/IP and uses the SMB protocol in Microsoft Windows for accessing files. With CIFS, users with different platforms and computers can share files without having to install new software.

SNMP (Simple Network Management Protocol)

A protocol that system administrators use to monitor networks and connected devices and to respond to queries from other network hosts.

SMTP (Simple Mail Transfer Protocol)

TCP/IP protocol for sending email between servers.

SSL (Secure Sockets Layer)

A protocol that provides authentication and encryption services between a web server and a web browser.

SSH (Secure Shell)

A secure transport protocol based on public-key cryptography.

TACACS+ (Terminal Access Controller Access Control System)

A method of authentication used in UNIX networks. It allows a remote access server to communicate with an authentication server to determine whether the user has access to the network.

Telnet

A terminal protocol that provides an easy-to-use method of creating terminal connections to a network host.

F: Compliance Information

(according to ISO/IEC Guide 22 and EN 45014)

Manufacturer's Name & Address:

Lantronix Inc., 15353 Barranca Parkway, Irvine, CA 92618 USA

Declares that the following product:

Product Name(s): Models SLC8, SLC16, SLC32, and SLC48 SecureLinx Console Managers

Conform to the following standards or other normative documents:

Safety: EN60950:1992+A1, A2, A3, A4, A11

Electromagnetic Emissions:

EN55022: 1994 (IEC/CSPIR22: 1993)

FCC Part 15, Subpart B, Class B

IEC 1000-3-2/A14: 2000
IEC 1000-3-3: 1994

Electromagnetic Immunity:

EN55024: 1998 Information Technology Equipment-Immunity Characteristics

IEC61000-4-2: 1995 Electro-Static Discharge Test
IEC61000-4-3: 1996 Radiated Immunity Field Test
IEC61000-4-4: 1995 Electrical Fast Transient Test
IEC61000-4-5: 1995 Power Supply Surge Test
IEC61000-4-6: 1996 Conducted Immunity Test
IEC61000-4-8: 1993 Magnetic Field Test
IEC61000-4-11: 1994 Voltage Dips & Interrupts Test

Supplementary Information:

This Class A digital apparatus complies with Canadian ICES-003 (CSA) and has been verified as being compliant within the Class A limits of the FCC Radio Frequency Device Rules (FCC Title 47, Part 15, Subpart B CLASS A), measured to CISPR 22: 1993 limits and methods of measurement of Radio Disturbance Characteristics of Information Technology Equipment. The product complies with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/EEC.

Additional Agency Approvals and Certifications:

VCCI

TUV

GS Mark

UL/CUL

C-Tick

CB Scheme

NIST-certified implementation of AES as specified by FIPS 197

This product carries the **CE** mark since it has been tested and found compliant with the following standards:

Safety: EN 60950
Emissions: EN 55022 Class A
Immunity: EN 55024

RoHS Notice:

All Lantronix products in the following families are China RoHS-compliant and free of the following hazardous substances and elements:

- Lead (Pb)
- Cadmium (Cd)
- Mercury (Hg)
- Hexavalent Chromium (Cr (VI))
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ethers (PBDE)

Product Family Name	Toxic or hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr (VI))	Polybrominated biphenyls (PBB)	Polybrominated diphenyl ethers (PBDE)
UDS1100 and 2100	0	0	0	0	0	0
EDS	0	0	0	0	0	0
MSS100	0	0	0	0	0	0
IntelliBox	0	0	0	0	0	0
XPress DR & XPress-DR+	0	0	0	0	0	0
SecureBox 1101	0	0	0	0	0	0
WiBox	0	0	0	0	0	0
UBox	0	0	0	0	0	0
MatchPort	0	0	0	0	0	0
SLC	0	0	0	0	0	0
XPort	0	0	0	0	0	0
WiPort	0	0	0	0	0	0
SLB	0	0	0	0	0	0
SLP	0	0	0	0	0	0
SCS	0	0	0	0	0	0
SLS	0	0	0	0	0	0

O: toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.
X: toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006.

Manufacturer's Contact:

Director of Quality Assurance, Lantronix Inc.
15353 Barranca Parkway, Irvine, CA 92618 USA
Phone: 949-453-3990
Fax: 949-453-3995

G: Warranty

Lantronix warrants each Lantronix product to be free from defects in material and workmanship for a period of **TWO YEARS** after the date of shipment. During this period, if a customer is unable to resolve a product problem and Lantronix Technical Support determines the product is defective, a Return Material Authorization (RMA) will be issued. Following receipt of an RMA number, the customer shall return the product to Lantronix, freight prepaid. Upon verification of warranty, Lantronix will -- at its option -- repair or replace the product and return it to the customer freight prepaid. If the product is not under warranty, the customer may have Lantronix repair the unit on a fee basis or return it. No services are handled at the customer's site under this warranty. This warranty is voided if the customer uses the product in an unauthorized or improper way, or in an environment for which it was not designed.

Lantronix warrants the media containing its software product to be free from defects and warrants that the software will operate substantially according to Lantronix specifications for a period of **60 DAYS** after the date of shipment. The customer will ship defective media to Lantronix. Lantronix will ship the replacement media to the customer.

* * * *

In no event will Lantronix be responsible to the user in contract, in tort (including negligence), strict liability or otherwise for any special, indirect, incidental or consequential damage or loss of equipment, plant or power system, cost of capital, loss of profits or revenues, cost of replacement power, additional expenses in the use of existing software, hardware, equipment or facilities, or claims against the user by its employees or customers resulting from the use of the information, recommendations, descriptions and safety notations supplied by Lantronix. Lantronix liability is limited (at its election) to:

Refund of buyer's purchase price for such affected products (without interest)

Repair or replacement of such products, provided that the buyer follows the above procedures.

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For details on the Lantronix warranty replacement policy, please go to our web site at http://www.lantronix.com/support/warranty/index.html